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FIRST ANNUAL REPORT

OF THE

STATE BOARD OF HEALTH

OF THE

STATE OF RHODE ISLAND,

FOR THE

YEAR ENDING DEC. 31, 1878.



PROVIDENCE:

E. L. FREEMAN & CO., PRINTERS TO THE STATE.

1879.



YASUNARI KAWABATA

# MEMBERS

OF THE

## RHODE ISLAND STATE BOARD OF HEALTH,

WITH P. O. ADDRESS AND TERMS OF SERVICE.

	<i>P. O. Address.</i>	<i>Term Expires.</i>
DAVID KING, M. D.....	Newport.....	1884.
HON. ELISHA DYER, Jr.....	Wakefield .....	1883.
CHARLES H. FISHER, M. D.....	Scituate .....	1882.
GEORGE W. JENCKES, M. D.....	Woonsocket .....	1881.
WILLIAM T. C. WARDWELL, Esq....	Bristol.....	1880.
ALBERT G. SPRAGUE, M. D.....	Centreville .....	1879.



*To the Members of the Rhode Island State Board of Health :*

GENTLEMEN:—An account of the more important transactions of the Board, and the work of the Secretary, during the eight months ending December 31, 1878, is respectfully presented in the general report herewith submitted.

The organization of a new department of State administration in all cases, necessarily involves the employment of considerable time, in acquiring a full knowledge of the duties of that department, and in the devising of methods of systematic administration. Some part of the work assigned the Secretary of the Board had been previously performed in several diverse departments of the civil government, and, therefore, the labor required, to attain a familiar acquaintance with all the details of these different forms of service, and to discharge the duties appertaining thereto, together with the new duties imposed by the Act establishing the Board, has given quite full occupation to the time of your Secretary since his appointment to the office.

The work has been performed in three departments of labor, which, though having many points and objects in common, have still, in several respects, distinctly separate purposes and modes of procedure. And though there is a unity in the whole, in regard to the objects to be attained, there must continue to be the same general division. The three departments comprise the investigation of the causes of disease, the superintendence of the collection, classification and tabulation of vital statistics, and the work of the Cattle Commission.

In the report will be found suggestions and remarks in regard to the several departments of labor, and the plans with which the work is designed to be prosecuted, and which seem to promise the best results.

The several papers, which are added to the report, are all of a practical character, and the information they will furnish, on all the subjects treated, will be of substantial value to all who study them.

CHARLES H. FISHER, *Secretary.*

PROVIDENCE, January 19, 1879.





PROVIDENCE, R. I., January 22, 1879.

*To the Honorable, the General Assembly of the State of Rhode  
Island:*

In compliance with the provisions of Chapter 680, of the Public Laws, the State Board of Health herewith respectfully presents the accompanying report of the Secretary, and appended papers, as the Annual Report of the Board, for the year ending Dec. 31, 1878.

DAVID KING, *Chairman.*

CHARLES H. FISHER, *Secretary.*

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## REPORT OF THE SECRETARY.

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I have the honor herewith to present my first Annual Report, as Secretary of the Rhode Island State Board of Health.

As an introductory to a clerical report of the doings of the Board, and the work of the Secretary, a brief history of the inception, and progress of the movement, which resulted in the Act of the General Assembly, establishing a State Board of Health, will be quite pertinent.

### ORIGIN OF THE BOARD.

On the last day of the May session of the General Assembly for the year 1877, a bill to establish a State Board of Health, was introduced in the Senate, and was referred to the Committee on the Judiciary. The framing of the bill was the result of a sudden impulse to bring the question squarely before the public, during the recess previous to the January session of the year 1878. There was no expectation that the bill would go through the hands of the committees of both houses, and be put on its final passage in both on that day, but that it would go over to the next session as unfinished business.

The provisions of the bill, framed without access to any legislation of like character, were few, but the desired object was quite as well accomplished. At the January session of the General Assembly for the year 1878, the bill came up as unfinished business, and was transferred from the Committee on the Judiciary of the House, in whose docket it then was, to the House Committee on State Charities and Corrections. That committee, in conference with Dr. E. M. Snow, Superintendent of Health, of the City of Providence, a Committee of the Providence Medical Association, and the Senator who presented the original bill, framed a new bill, which was reported to the House by them, as a substitute for the bill referred to them.

Previous, however, to any active movement by the Committee on State Charities and Corrections, in the direction of framing a new bill, the Governor had received a communication from the Secretary of the International Medical Congress of 1876, enclosing a resolution of that body directed to the Governors of all the States, earnestly requesting them to recommend to their respective legislatures the enactment of laws establishing State boards of health, whenever such boards of health had not already been established. This communication was presented, and referred by the Governor to the Joint Committee on Executive Communications. That committee made the following Report.



## REPORT OF THE JOINT COMMITTEE ON EXECUTIVE COMMUNICATIONS.

*To the Honorable General Assembly:*

The joint committee on executive communications, to whom was referred a "Circular and Resolutions of the International Medical Congress in relation to the establishment of State Boards of Health," respectfully report that they requested Dr. Charles H. Fisher, a member of said committee to prepare a paper on the general subject of State Boards of Health, which is herewith submitted and is as follows :

*Mr. Chairman and Gentlemen of the Committee:*

In compliance with your request, I herewith submit some suggestions, touching the questions involved in the communication of his excellency, the Governor, of a circular and resolution of the International Medical Congress, in relation to the establishment of State boards of health.

The first question which naturally presents itself, is the one of practical utility,

### IS A STATE BOARD OF HEALTH NEEDED ?

If answered in the affirmative, then follows the question: what are the reasons for so believing ! In order to intelligently consider the question, it is necessary, first to make a statement of facts, appertaining to the general public, in relation to health and life, and their influences, social, civil and political. The value of public health can scarcely be overestimated. It is the absolutely indispensable foundation, of a vigorous and prosperous state.

### PUBLIC HEALTH IS PUBLIC WEALTH,

said the statesman and philosopher, Benjamin Franklin.

What is public wealth ?

By whatever name we may express the units and constituents of wealth, it is in the aggregate almost wholly the product of labor. Labor to be effective, must depend on good health, and so indirectly, *health is wealth*, or its chief factor.

**INVALIDISM IS A PUBLIC AS WELL AS PRIVATE CALAMITY.**

Every individual disabled wholly or in part, by sickness, is to that extent and degree of disablement, not only a burden and loss to self and family, but also a burden and loss in various ways to the community and the State.

Invalids not only lose their own time for productive labor, but compel to a greater or less extent, the loss of time of others in their care, and also sustain pecuniary losses, to recover which, entails still further personal loss of time, and therefore loss to public productiveness.

Setting aside for the present all moral and humanitarian aspects of the question, suppose it to be examined solely on the business and pecuniary side, in the light of dollars and cents.

Assuming there are only 250,000 persons residing in the State, would it be unreasonable to assert that on an average there are 12,500 persons of all ages sick, or one in every twenty of the whole, i. e. five per cent., and that the requisite attention to the sick would require the time of somewhat above half as many more, say 7,500, or three per cent., making 20,000 in all, or eight per cent. Now if the labor of the whole population will average seventy-five cents per day, the scale running from nought to \$20 or more, here is a clear loss of \$15,000 a day to private and public wealth, during the continuance of the sickness, to say nothing of the loss thereafter; \$15,000 a day for 300 days makes the large sum of \$4,500,000.

That this estimate is not too high, may be inferred from the report of the Superintendent of the Census of 1875. On page 151 it is stated that the average wages in the whole State, for the woolen manufacture, was for all ages, \$1.17½. In this as well as in cotton and other employments, are children of ten years of age. On page 152 it is stated that in the cotton manufacture the average wages per diem are higher. These employments are referred to because they are supposed to afford the minimum wages of all occupations. In the professional, commercial and mechanical employments the average wages are considerably in excess of the manufactures alluded to.

It is believed that a very considerable part of the sickness that afflicts humanity is preventable. This belief is founded on what seems to be positive evidence, afforded by results of measures taken in some localities for the prevention and restriction of various diseases. Health boards have been in operation in many parts of England for more than thirty years, and the results of their labors have been so satisfactory as to lead the general government to establish them in almost every

borough of the kingdom. The reports *show conclusively that the sickness and mortality of those localities have been very materially reduced.* Suppose in Rhode Island by means of proper measures, the sickness could be diminished five per cent., which certainly is a low estimate, we should, on the calculation above, have a daily saving of \$750, or a yearly saving of \$236,000. This seems like a large saving for a small expenditure of money, but the conclusion is justified by facts!

We have another item of loss in the death of individuals. It may be assumed that the average individual at twenty years of age is worth in prospective availability, the average cost of support during the period of dependence, including food, clothing, education, care when young and in sickness, expenses of sickness, and every item, directly and indirectly. Suppose the average sum be estimated at \$100 per annum, then the average individual would have, at twenty years of age, a personal value of \$2,000 at least, (as no interest on cost is added,) as an investment of the public, and capable of adding to the public wealth a fair dividend, say five per cent., or \$100 per annum.

Now according to life and annuity tables, such person would have an expectation of fifty-two years of life, and an average of forty-five years of effective and productive value. It will be seen that the amount at the end of forty-five years, would be a very considerable sum. But if the individual should be stricken down by death, at that age, then the whole would be lost, and so would a proportionate loss be sustained by the death of an individual at any time, during the period of development or effectiveness.

In regard to this estimate, it may be stated that on page 158 of the Report of the Census of 1875, the total products of the State, for the year ending June 1st, 1875, were \$133,025,291; equal to \$515.12 for each person, of all ages in the State; or an average of about \$1.72 per day for every man, woman and child, allowing fifteen days each for lost time per annum. Now, with the previous estimate of the average of 75 cents per diem for individuals of all ages, sick or well, from infancy up, the amount of wages for labor for 300 days would be \$58,101,750, leaving about \$75,000,000 profit. This would leave, also, nearly \$300 per annum for every person of all ages and conditions in the State, as an addition to the public wealth, instead of \$100, the previous estimate.

The mortuary tables of the registration report for 1876, show the decease of 4,116 individuals during that year. Of these, at least 3,500 were in the effective, or expectantly effective period of life. Suppose the average public value of these persons be estimated—not at \$2,000,

the average value at twenty years of age, but at one quarter that sum—\$500, the loss to the public would then amount to the large sum of \$1,750,000. Now if by State action, five per cent. of these lives could have been saved, and that cannot be called a high estimate, we shall find the number of lives which might have been saved to be 175, and the amount of prospective public wealth preserved, the sum of \$87,500. If to this sum we add the \$236,000, the moderate estimate of the annual amount saved by the prevention of sickness, we have then the very large sum of \$323,800, which it is believed might be annually saved the State, by such measures as could be put in effective operation by a judicious board of health. Of course, there are many minor items of loss, public and private, which are the inseparable concomitants of sickness and death, not now to be taken into account, the purpose of this paper not contemplating the aggregation of minor details. The foregoing simply presents a summary exhibit of the coarser financial features of the question, on the dollar side.

If we now take into consideration the moral aspect of the question, we are met at the threshold with a multitude of facts, more abhorrent and appalling, than can be presented from any other view. It would be impossible, within the proper limits of this paper, to portray, except in the most cursory manner, the immense amount of degradation, vice and crime, that directly or indirectly have their origin in sickness of the body. They seem to be mutually causative the one of the other, and mutually convertible. Sickness in some, benumbs the moral nature, clouds the judgment, induces nervous irritability that intensifies the animal propensities, and these lasting longer than the return of bodily strength, through perversion of moral sense, plunge the unhappy victims into dissipation and degradation. But for sickness, many slums of vice would be depopulated.

How sickness of body taxes the resources of the State can be readily traced through various down hill grades, to the alms houses, jails, and penitentiaries. The civil and political aspects of the question, are so intimately involved in the brief considerations above, that they need no separate discussion.

By these statements we find the State a great loser by reason of sickness and death. Suffering financially, suffering socially and morally. The foundations of public and private virtue sapped, its future prosperity and existence endangered. What then? Can anything be done to stay the moral and physical death? The laws of nature are beneficent, rightly observed, but violated, are a two-edged sword. Though absolute, they are not tyrannical, they recognize the sacredness of

human life, and the blessedness of human health. The great fear of human mortals should be less the servile fear of human authority and human opinion, and more the fear of Divine authority, as declared and administered through the laws of nature. But when natural laws are recklessly or ignorantly violated by masses of citizens, it is the *duty* as well as the right of the State to interpose, and while seeking diligently to enlighten its people, should also affix a just penalty for violation of its own laws, enacted for the better observance of the laws of nature. It does seem as if the time has come when the State *cannot justifiably* withhold its authority in the devising and maintaining of proper measures for the protection of life and health, by instituting such inquiries in regard to the influence of locations, occupations, habits, customs and indulgences, as humanity requires, and by such interference in the removal of causes of sickness and death as common justice demands.

#### ECONOMY OF EARLY SANITARY ACTION.

The towns of Rhode Island are, with very few exceptions, in process of steady growth in population. Within some of them are conditions limited to small areas which, if allowed to remain, will, at no very distant day, become sources of disease, entailing great pecuniary loss, private and public. In most of them, these sources of future danger can be removed or remedied at very small cost, during these earlier periods of their growth, and thus stamped out, much suffering and expense prevented. But, by reason of delay, may be so hidden by the so-called march of improvement, that their existence is lost sight of and forgotten, until the outburst of some terrible epidemic reveals the perilous and portentous fact. And also, by reason of delay, some of these fountains of death may become so incorporated with large pecuniary investments, and thereby acquire the title of "vested rights" of individuals, that, though the right of eminent domain should be unlimited in the interests of public health, there would still remain the probability of costly litigation, and heavy damages. The attention of the general public, under direction of recognized authority, would readily detect many of these future sources of disease, and so be easily and cheaply preempted in the interests of humanity and public health.

For the purposes suggested above, of the prevention of disease and the protection of life, and thereby the enhancing of the interests of individuals and the State, it cannot be reasonably denied that

## A STATE BOARD OF HEALTH IS NEEDED.

Because there is no other agency to effect the desired objects, or put in operation the desired measures. It is true that all intelligent and well educated physicians are regarded as the established conservators of the public health, and it is their duty to observe and study diseases in all their relations, to collect facts in regard to circumstances surrounding, as well as conditions personal to, and inhering in, the suffering individual, but they cannot, without going outside the daily routine of professional work, and at pecuniary loss, enter upon the wider labor of a comprehensive survey of the entire broad field of morbid phenomena, as affecting a large area of communities. This work, it is *the policy as well as the duty* of the State to put in operation. The question may be asked, how can a board of health accomplish the desired objects?

## BY POPULARIZING A KNOWLEDGE OF THE MEANS OF AVOIDING DISEASES.

The dissemination among the masses of the people, of information in regard to the prevention of disease, emanating from acknowledged authority, would without question be respected, and its suggestions be largely observed. Such information, widely diffused, need not necessarily be attended with much expense. Tracts of one, two, or more pages of printed matter, at insignificant cost, can be scattered among the families of the State where they would be of value. Such distribution might be easily accomplished through town superintendents of public schools, and many other agencies. Then again, doubtless, the public press, at intervals, would admit short articles of a half column or so, without any expense to the State, on the policy of furnishing to its readers matter of public interest and value. In this way great numbers of the people, otherwise ignorant, thoughtless or indifferent, would have their attention effectively called to sources of danger and the means of defence. Notwithstanding the fact, that so many

" Know the right and approve it too,  
But know the wrong, and yet the wrong pursue,"

and the known perversity and carelessness, characteristic of human kind, it must be admitted that popular hygienic information and instruction, so diffused, must inevitably largely influence the public mind and perceptibly decrease the percentage of sickness and the death rate. Among the common causes of preventable disease, about which the masses of the people need more positive knowledge, may

be mentioned vitiated air, absence of light, morbid emanations from cess-pools, sink drains, decomposing garbage; haze and dusts holding animal, vegetable or inorganic irritants and poisons, special morbid products derived from diseased bodies of men or animals, exhaustion of physical and mental vitality, by too prolonged or excessive labor of body or mind, loss of sleep; violent anger, grief or joy, and long immersion in cold and humid atmospheres. It will be seen that a State board is needed

#### TO GIVE UNITY OF PURPOSE AND EFFECTIVENESS

to diffusion of sanitary knowledge, and to direct investigation in a systematic manner:

1. The first, and the continued leading object of a State board of health should be (*a*) the general enlightenment of the people in sanitary knowledge, (*b*) so that they may have a clear understanding of the rights, duties and responsibilities of all persons in relation to public as well as to personal health; and (*c*) to perceive the necessity of the earnest observance and enforcement of good sanitary laws and regulations, as the foundation of success, in the promotion of health and longevity.

2. To act as a central board in giving enlightened direction to all labors of a sanitary character, that may be instituted in different sections of the State; first, by suggesting systematic and uniform methods of inquiry and investigation; second, by suggesting the best modes of applying general sanitary laws to special or local circumstances; and third, by suggesting to local authorities the presumably best means of securing popular support to local sanitary administration; and fourth, by encouragement and promotion of formation of village health clubs, who will look after the performance of the sanitary duties of their respective localities, under the superintendence of the central board.

3. In reference to the above remarks, it need hardly be observed that the inference is clear that every person, family, community, town and city, have each certain individual and local, as well as general, duties and responsibilities in regard to the prevention of disease and loss of life, and while more widely spread and general causes of peril to life and health exist, requiring a central sanitary organization, such central organization can most fully accomplish its purpose by giving unity of purpose, counsel and aid to local organizations.

4. Such local organizations, by observation and inquiry, can collect a mass of facts, not otherwise so well attainable. These facts singly, may seem and be of little value; but, reported from many points, over a considerable extent of territory, and under a great variety of circumstances, will, when properly arranged and classified, and subjected to a reasonably inductive method of study, become a valuable basis for generalizations and logical conclusions, and also valuable as affording great aid in the observation and detection of new facts. Sanitary observations must necessarily extend over a considerable territorial area, comprising cities, towns and villages, neither of which alone can furnish all the facts absolutely needed for full generalization. What is true of a city, may not be true of a country town or village, any more in sanitary matters than in morals, habits or customs. Consequently, the jurisdiction of the central board, should comprise supervision, not only of important, but also such as at first thought, might be regarded as unimportant localities.

There has been in contemplation, for a number of years, the establishment at the national capital of a national health bureau, or a public health commission for the United States. Such a bureau like the signal service office, must be in regular correspondence with responsible bodies in all the several States; bodies having defined duties and authorities, such as are conferred on State boards of health. At this time there are three departments of the national government doing all their limited authority will allow, in the way of collecting an accurate knowledge of, and in the restriction and prevention of diseases, mostly of an epidemic character. They are the surgeon general's bureau of the army, the medical department of the navy, and the marine hospital service. Compared with what might be accomplished by a bureau established for the specific purpose of promoting the national health, their work is very limited. When all the States, or nearly all, (and the time is near at hand, nearly one-half already) have established boards of health, then the knowledge acquired in the several States can be utilized by a national board, to the great advantage of the nation. Without question, in a majority of cases, the inception and development of pestilences can be detected at the outset, the course of the epidemics, and the spread of the contagion arrested, and their existence stamped out.

A bill is now pending in the Senate of the United States, having passed the House of Representatives with such unanimity as to give good assurance of its becoming a national statute, to aid State and municipal authorities in excluding from the country contagious and



infectious diseases. It requires weekly reports from Consuls of the sanitary condition of foreign ports, and oftener by telegraph if at hand, if needful to announce the departure of suspected vessels or persons, and requires all needful information to be distributed to the local State and municipal authorities, by the Surgeon-General of the Marine Hospital Service. It alludes to State organization of boards of health in such a way as to lead to the inevitable inference that the general government expects that state boards of health will be soon universally established throughout the country.

The limited time allotted me forbids a more extended consideration of the subject at the present time; but such suggestions as have been made are simply skirmishing on legitimate ground, for the more the field of sanitary observation, presenting prospective benefits from systematic legal supervision, is surveyed, the wider its borders extend. There is to-day in all the broad world no material agency of any kind whatsoever, that is working out so many, promisingly beneficent results to mankind, as that which is involved in the universal application of the laws of sanitary science. They are demonstrating that health and longevity are the natural inheritance of mankind; that disease is abnormal, and death accidental, except from natural decline of age; and that both are largely preventable by human agencies.

CHARLES H. FISHER,

For the Committee on Executive Communications.

The above report of the Joint Committee on Executive Communications, was presented in the Senate simultaneously with the introduction in the House, by the Committee on State Charities and Corrections of the new bill for the establishment of a State Board of Health. This bill after reference to another committee of the House, and after various delays, verbal alterations and amendments in both houses, was finally passed and became a law as follows :

#### AN ACT TO ESTABLISH A STATE BOARD OF HEALTH.

*It is enacted by the General Assembly as follows:*

SECTION 1. The Governor, with the advice and consent of the Senate, shall appoint six persons, two from the county of Providence, and one from each of the other counties, who shall constitute the State Board of Health. Of the persons so appointed, at least three shall be well educated physicians and members

of some medical society incorporated by this State. The Governor may remove any member for cause, at any time, upon the written request of two-thirds of the Board.

SEC. 2. The six persons first appointed, shall be appointed for one, two, three, four, five and six years respectively, and hereafter, the Governor, with the advice and consent of the Senate, shall appoint one member of the Board annually, for the term of six years from the first day of July. Any appointment to fill a vacancy, shall be for the remainder of the term.

SEC. 3. The Board shall take cognizance of the interests of life and health among the citizens of the State; they shall make investigations into the causes of disease, and especially of epidemics and endemics among the people, the sources of mortality, and the effects of localities, employments, conditions and circumstances on the public health, and shall faithfully do all in their power to ascertain the causes and the best means for the prevention of diseases of every kind in the State. They shall publish and circulate, from time to time, such information as they may deem to be important and useful for diffusion among the people of the State, and shall investigate and give advice in relation to such subjects relating to the public health, as may be referred to them by the General Assembly, or by the Governor when the General Assembly is not in session.

SEC. 4. The State Board of Health shall also investigate the subject of diseases among cattle or other animals, and perform all the duties which have been delegated to the Board of Cattle Commissioners in Chapter 76, of the General Statutes of the State.

SEC. 5. Section 3, of Chapter 76, of the General Statutes, is hereby repealed, and the Board of Cattle Commissioners heretofore constituted under authority of said section, is hereby abolished.

SEC. 6. In every section of Chapter 76, of the General Statutes, where the word "commissioners" occurs, it shall be construed to mean State Board of Health.

SEC. 7. The State Board of Health shall receive the returns of births, marriages, deaths and divorces, and shall prepare the annual report upon the registration of the same as now required by law, but after the report is prepared, the returns shall be deposited in the office of the Secretary of State, to be bound and indexed by him as heretofore.

SEC. 8. Wherever the words "Secretary of State" occur in sections 1, 2, 3, 16 and 19, of Chapter 77, of the General Statutes, they shall be construed to mean Secretary of the State Board of Health, and in the sixth line of section 2, of said chapter, the word "he" shall be construed to mean Secretary of State. Section 17, of Chapter 77, of the General Statutes, is hereby repealed.

SEC. 9. The Board shall meet in the city of Providence once in three months, and as much oftener as they may deem necessary. No member of the Board, except the Secretary, shall receive any compensation for his services; but the actual personal expenses of any member, while engaged in the duties of the Board, shall be paid by the State.

SEC. 10. The Board shall elect a well qualified physician as their Secretary.

SEC. 11. The Secretary shall perform and superintend the work prescribed in this law and such other duties as the Board may require, and he shall receive such salary, not in excess of twelve hundred dollars per annum, as the Board may determine. He shall hold his office at the pleasure of the Board, but may be removed at any regular meeting by a majority vote of the members thereof.

SEC. 12. The Governor shall provide a suitable office for the Board, in the city of Providence, and the actual expenses of the Board and of the members thereof, when certified by the Chairman and approved by the Governor, shall be paid from the treasury of the State.

SEC. 13. The Board shall make a report in print, to the General Assembly, annually in the month of January, of its proceedings during the year ending on the thirty-first day of December next preceding, with such suggestions in relation to the sanitary laws and interests of the State as they shall deem important.

SEC. 14. All acts and parts of acts inconsistent herewith are hereby repealed.

SEC. 15. The several town councils and boards of aldermen shall still be *ex-officio* boards of health in their respective towns, as is now by law provided; *provided, however*, that the city council of any city may appoint a board of health for such city, which shall have all the powers and duties now conferred by law upon the board of aldermen as a board of health.

In accordance with the provision of the law, requiring the "Governor with the advice and consent of the Senate," to appoint the six persons who together should constitute the Board, His Excellency at a proper time presented to the Senate, the following persons in the order named, with the county represented, and the terms of service respectively, viz :

DAVID KING, M. D., Newport County.....	six years.
ELISHA DYER, Jr., Washington County.....	five "
CHAS. H. FISHER, M. D., Providence County.....	four "
GEORGE W. JENCKES, M. D., " " .....	three "
WM. T. C. WARDWELL, Bristol " .....	two "
ALBERT G. SPRAGUE, M. D., Kent " .....	one "

The appointees were unanimously confirmed by the Senate:

#### ORGANIZATION OF THE BOARD.

Ten days after the rising of the General Assembly, to wit: the 22d day of April, the members elect were called together at the State House in the city of Providence, by David King, M. D., of Newport, in obedience to the order of the Governor. Upon the assembling of the members, the oath of office was administered by the Secretary of State, and after calling the meeting to order, Dr. King made the following remarks :

*Gentlemen of the State Board of Health :*

By order of the Governor of the State, it has become my duty as your senior member, to call together the members of the Board. The objects of our investigation are of the highest importance to the welfare of the State. Within the department of public health, improvements and reforms, inaugurated by us, will be beneficial in their tendency, and permanent in their influence. We cannot but engage in the respectable, I may say, high duties, assigned us by the government of the State, with the pleasing and assured prospect of accomplishing much good in our midst.

It will be our duty to take cognizance of the interests of life and health among the citizens of the State, to make investigations into the causes of disease, the sources of mortality, and the effects of localities, employments, conditions and circumstances on the public health, and to faithfully do all in our power to ascertain the causes, and the best means for the prevention of diseases of all kinds in the State. And not of men alone, but to investigate also, the subject of diseases among cattle and other animals.

The field of our duties and labors is therefore wide, embracing every circumstance and agency that can affect animal life, or man, regarded as a physical being, or as a physical being endowed with an intellectual and moral nature.

A distinguished writer of acknowledged authority has declared, "that public or State medicine has for its primary object the prevention of disease; the surrounding the sick with conditions most favorable to recovery; and the diminution in a marked manner of the death roll of the people; that the ultimate object of State medicine is the improvement of the races of men to their highest possible degree of perfection." This may be regarded as a fair and comprehensive statement of the aims and purposes of the State Board of Health.

In the consideration and investigation of subjects having a practical bearing on public health, I trust that we shall deliberate and act with a due sense of the responsibility placed upon us by the Governor and General Assembly, and with the spirit and energy of men entrusted with these most important interests of the State.

Among the subjects especially demanding our attention, may be mentioned:

1. Epidemic, Endemic, and Contagious Diseases.
2. Sewerage and Drainage.
3. Food, Drinks, and Water-Supply.
4. Buildings—Public and Private; including Ventilation, Heating, etc.
5. Climate—General and by Season of Year; and as related to Age of Inhabitants.
6. Disposal of Excreta and Decomposing Organic Matter.
7. Poisons, Explosives, Chemicals, Accidents, and Special Sources of Danger to Life and Health.
8. Occupations and Recreations.
9. Education: the Relation of Schools to Health, the kind and methods of instruction in use, and methods to be proposed.
10. Geology and Topography: Influence on health, of Forests and their removal, Shade Trees near Dwellings, etc.
11. The Death-Rate as influenced by Age, Climate, and Social Condition.
12. Legislation in the Interests of Public Health.
13. Finance.
14. Mental Hygiene.

A temporary organization was then formed, and upon the calling of the roll, the following members were found present, viz:

DAVID KING, M. D. ....	Newport.
Hon. ELISHA DYER, Jr. ....	Wickford.
GEORGE W. JENCKES, M. D. ....	Woonsocket.
CHARLES H. FISHER, M. D. ....	Scituate,
ALBERT G. SPRAGUE, M. D. ....	Warwick.

Upon motion, Dr. David King was unanimously elected permanent Chairman, and Charles H. Fisher, permanent Secretary.

#### WORK OF THE BOARD.

Under this head, it is not designed to report all the transactions, that are put on the record of the various meetings of the Board, but such only as will give a general outline of the plans and purposes governing its action, in laying out work for itself and the Secretary.

At the meeting for organization, and following the election of officers, considerable informal discussion of various topics relating to the public health ensued. The subject of the prevalence of glanders and farcy among horses, was considered at greater length than any other, and the necessity of immediate action for its restriction was apparent. A set of regulations having particular reference to glanders and farcy in horses was adopted, and the Secretary was authorized to publish the same in the newspapers of such counties or districts, as were found by inquiry to have horses affected with the said disease. The advertisement was as follows:

#### RHODE ISLAND STATE BOARD OF HEALTH.

##### GLANDERS IN HORSES.

At a meeting of the State Board of Health held Monday, April 22, 1878, the following regulations were adopted and ordered to be published:

1. The owners of, or any person having the care of any horse or other animal, knowing the same to have the disease called glanders or farcy, shall keep such horse or other animal apart and separate from all other horses or animals.
2. The owner, or any person having the care of any horse or other animal, knowing the same to have the disease called glanders or farcy, shall not lead, nor drive, nor permit such horse or other animal to go in or over any public street, road, lane or highway in this State.
3. Any veterinary surgeon or other person who shall have knowledge of any horse or other animal that has the disease called glanders or farcy, shall report

the existence and location of such case of disease to some member of the State Board of Health within twenty-four hours after receiving knowledge of the same.

The penalty for failure to comply with the above regulations, as fixed by Section 8, Chapter 76, of the General Statutes, is a fine not exceeding three hundred dollars, or imprisonment not exceeding one year.

The first section of the same chapter provides that any person who shall knowingly expose a horse or other animal having any infectious or contagious disease to other horses or animals not infected with such disease, shall be fined not less than one hundred dollars, nor more than five hundred dollars.

Section 7 provides that any person who shall sell or offer to sell any horse or other domestic animal known to him to be infected with any contagious disease, shall be fined not more than one thousand dollars, or be imprisoned not exceeding two years, or both, at the discretion of the court.

All persons are urgently requested to give immediate information to some members of the State Board of Health of any known or suspected case of glanders or farcy that may come to their knowledge, and such cases will be immediately investigated and measures taken to prevent the spread of the disease.

The names and post office address of the members of the State Board of Health are as follows: David King, Newport; Elisha Dyer, Jr., Wickford or Providence; Charles H. Fisher, North Scituate; George W. Jenckes, Woonsocket; William T. C. Wardwell, Bristol; Albert G. Sprague, Centreville.

By order of the State Board of Health.

DAVID KING, Chairman.

CHARLES H. FISHER, Secretary.

PROVIDENCE, April 24, 1878.

These regulations had been previously adopted and published by the preceding Cattle Commission. The Secretary was also authorized to employ, the same means and agencies heretofore employed by the Board of Cattle Commissioners, for the purpose of ascertaining the existence, and for the restriction and suppression of glanders and farcy, or any other highly contagious and dangerous diseases, among horses or other domestic animals. (*See Cattle Commission page 11.*)

At the same meeting a committee was appointed to draft a code of By-Laws for the government of the Board. Dr. George W. Jenckes, chairman of that committee, reported at the next subsequent meeting, a code recommended by the committee. The several sections of the reported code were taken up in order, considered, and severally adopted. They are as follows:

## BY-LAWS.

SECTION 1. This body shall be known as the Rhode Island State Board of Health.

SEC. 2. The officers of the Board shall consist of a Chairman, Secretary and Auditor, to be chosen annually at the meeting in July.

SEC. 3. The duties of the chairman shall be to preside at the meetings of the Board, to put all votes, to decide questions of order, and to appoint all committees when not otherwise voted by the Board. He shall certify all audited bills to the Governor for payment.

SEC. 4. The Secretary shall perform all duties prescribed in the act establishing this Board, shall keep a record of the proceedings, shall do all acts usually incident to the office, and shall notify the members of all regular meetings, and by the advice of the Chairman, shall call all special meetings.

The Secretary shall have an office in the city of Providence, which he shall keep open between the hours of one and three o'clock P. M., upon all business days.

SEC. 5. The auditor shall examine all bills and vouchers, and if correct shall certify the same to the Chairman of the Board.

SEC. 6. A majority of members shall constitute a quorum to transact business but any member may adjourn.

SEC. 7. The regular meetings of this Board shall be holden at its office in the city of Providence, on the first Wednesday of July, October, January and April, respectively, at such hour as the Board may by vote determine from time to time.

## VITAL STATISTICS.

No department of the work of the State Board of Health is of more importance than that which relates to the collection and registration of births, marriages and deaths. Twenty-five years ago, many collectors of returns of births and deaths, were met with censure, and even with resistance, from some persons who occupied respectable positions in society. The law, and the work of carrying out its provisions, were denounced as a scheme concocted mainly for partisan and political purposes. All feeling of that kind has now no existence except among the lowest and most ignorant class of our population. The value of such registration in relation to the legal rights of individuals, is now too clear to be disputed, but there are many minds still clouded, in regard to the value of the registration of births, and of full returns of the attendant conditions and circumstances of

death, as a basis of sanitary and social and political economy. These clouds, however, must at no distant day disappear, when their importance, properly classified, arranged and compared, for sanitary study is better known, as have those which a few years since obscured some ordinary minds in regard to the value of registration, in relation to descent and inheritance.

The opposition to the collection of statistics alluded to above, does not apply solely to this State. The measures taken to obtain such facts as were called for in the United States Census of 1790 were violently opposed by the people in some of the States as an invasion of private rights.

It required several years to satisfy large masses of citizens, that the movement would promote a large public interest, that the country would not know itself, but for the facts elicited and spread before the people by each decennial Census.

The enumeration of the peoples, of the products, and of the properties of all kinds, shows us what we are, what we have in possession, how we progress. By this enumeration the government learns its military and financial strength. By it is ascertained what will best promote the prosperity of sections, and what, that of the country at large.

The enumeration of births, marriages and deaths in the United States Census, has been found quite as important as that of any other class of statistics. It indicates the bodily vigor, the moral tone, the relative longevity, and consequently the status of the public health, in the various divisions of the country, its augmentation or its decline. Upon public health depends the strength and stability of the government, and therefore by these statistics it may learn its probable prosperity or adversity.

#### RETURNS OF BIRTHS.

The Statutes provide that the town clerk of any town, or some person appointed by the town council, or board of aldermen of a city, shall obtain all information concerning births, occurring during the previous year among the inhabitants of their respective towns, and on or before the first Monday in March annually, to make certified returns thereof to the State Board of Health. This mode is doubtless as effectual for accurate returns, as any that can at present be devised. It is especially useful in obtaining the full names of children born, early in the preceding year, which could not be done soon after birth. It is, however, defective in that it fails to enumerate



in many towns, all the births that have occurred in those towns. The frequent removals of families from one town to another; the occupation of the same tenement by several families during the year; therefore, births occurring in these migratory families are not returned, because few or no facts can be ascertained in regard to them in the towns where they occurred, and they cannot be registered in the towns where they are found, during the months of January and February of the ensuing year. Some births also fail to be returned because of the death of the child in early infancy, and forgetfulness or indifference on the part of parents and neighbors.

Different methods of collecting birth statistics have been adopted, since the first registration law was enacted. It was at one time obligatory on the part of the parents to make return to the town clerk within ten days after the occurrence of the birth of any child.

Physicians were also required by law to make returns of births occurring in their practice, and a small fee to be paid out of the town treasury was allowed therefor. But the present mode has been far more efficient than any other heretofore tried. It might be suggested that amendments to the present law be made, requiring the collector of birth returns, when he ascertains that a birth had occurred in another town, in any family living in the town which he is canvassing, he shall make a separate return of such birth, which he shall transmit to the town clerk of the town in which such birth occurred, and receive therefor, from the town to which such return was made, a fee double the usual amount.

The form of Returns of Births have varied somewhat since the passage of the Registration Act of 1854. The form now in use is as follows :

## RETURN OF A BIRTH.

STATE OF RHODE ISLAND.

1. Date of Birth ?.....	.....
2. Full name of the Child?.....	.....
3. Sex?.....	.....
4. Color?.....	.....
5. No. of Child of Mother?.....	.....
6. Place of Birth?.....	.....
7. Father's Name?.....	.....
8. Father's Age?.....	.....
9. Father's Occupation?.....	.....
10. Father's Birthplace?.....	.....
11. Mother's Name?.....	.....
12. Mother's Maiden Name?.....	.....
13. Mother's Age?.....	.....
14. Mother's Birthplace?.....	.....
15. Color of Parents?.....	Fa..... Mo.....
16. Remarks.....	.....

## INFORMANT.

N. B.—At No. 2, give the full name of the child, and be particular to get middle name in full. At No. 4, state whether the child is white, black, or mulatto. At No. 5, state whether it is the 1st, 2d, 3d, etc. child of the mother. At No. 6, give the street and number, if in the city, the town and State, if elsewhere. At Nos. 8 and 13, give the age at last birthday. At Nos. 10 and 14 give the town and State, if in this country.

If the child was still-born, or has died since its birth, state the facts at No. 16, with any other facts of interest.

In case of twins or triplets, a separate blank is to be filled for each child.

## RETURNS OF MARRIAGES.

The returns of marriages in the State of Rhode Island, are without question more full and accurate than those of births and deaths. The popular impression of their importance to the public at large, as well as to the individuals immediately interested, is much stronger, and the feeling of responsibility on the part of those who perform the ceremony, is clearer and more imperative. The returns of marriages for the whole State, for the year 1877, were 2,282, as against 2,253 for the year 1876, showing that the prevailing hard times, have not prevented a partial return toward the number registered in previous years. For the year 1873 there were returned for the whole State 2,630. The form of return now in use is as follows:

[FACE.]

## RETURN OF A MARRIAGE.

STATE OF RHODE ISLAND.

1. Full name of GROOM?.....	.....
2. Place of Residence?.....	.....
3. Age in years?.....	.....
4. Occupation?.....	.....
5. Place of Birth?.....	.....
6. Father's Name?.....	.....
7. Mother's Maiden Name?.....	.....
Parents' Birthplace?..	Fa.....Mo.....
Parents' Occupation?..	Fa.....Mo.....
8. Full name of BRIDE?.....	.....
(Maiden name if a widow?).....	.....
9. Place of Residence?.....	.....
10. Age in years?.....	.....
11. Place of Birth?.....	.....
12. Father's Name?.....	.....
13. Mother's Maiden Name?.....	.....
Parents' Birthplace?..	Fa.....Mo.....
Parents' Occupation?..	Fa.....Mo.....
14. No. of Marriage?.....	Of Groom?.....Of Bride?.....
15. Color of the Parties?.....	.....

N. B.—At No. 15, state whether white, black or mulatto. At No. 14, state whether this marriage is the 1st, 2d, 3d, &c., marriage of each. Give middle names in full.

.....18

We, the Groom and Bride named in the above certificate, hereby certify that the information given is correct to the best of our knowledge and belief.

.....GROOM.

.....BRIDE.

Signed in presence of.....

and.....

N. B.—The above blanks must be filled, and the certificate must be signed by both Groom and Bride, and must be given to the person about to solemnize the marriage, *before* the marriage can be legally solemnized in the State of Rhode Island.

[REVERSE.]

# CERTIFICATE OF MARRIAGE.

STATE OF RHODE ISLAND.

I HEREBY CERTIFY, That.....  
 .....were joined in Marriage by me, in accordance  
 with the laws of the State of Rhode Island, in the town of.....  
 this.....day of.....A. D. 18

ATTEST.....

Witnesses to the Marriage.....

N. B.—The Clergyman or other person solemnizing the marriage is required to sign this certificate, and return it to the Clerk or Registrar of the town or city in which the marriage takes place, *on or before the second Monday of the month succeeding the date of the marriage.*

The laws of Rhode Island require at least two witnesses to be present at a marriage, in addition to the parties and the Clergyman officiating. Give the names of two who were present.

## RETURNS OF DEATHS.

The mortuary records of the State, can be made to furnish a vast amount of valuable information, when the physicians' certificates, make definite replies to specific questions, touching the phases and characteristics of fatal diseases, and the conditions and circumstances under which the deaths occur. It is, however, too much to expect, that returns bordering on completeness in that respect can at any early day be available.

The general professional mind must first be imbued with a deeper feeling of regard for the best welfare of its patrons beyond the period of immediate sickness, and also of responsibility to the great public and the State. "To make investigations into the causes of disease, the sources of mortality, and the effects of localities, employments, conditions and circumstances on the public health," as the law directs, must of necessity demand more extended interrogatories in the physicians' certificate, than have heretofore, or are now made in the returns of death. The town Registration Record of deaths, need not be changed for such additional questions, but the summarized Reports to be transmitted to the State Board of Health, must have spaces and columns to correspond with all the questions on the returns. Such blank Reports will be forwarded to all the town clerks in time for tabulation of the returns for the year 1879. Recognizing the great importance of *accurate* and *complete* returns of deaths for purposes of sanitary study, and desiring to ascertain how fully the provisions of the law were complied with, in regard to death returns, I sent the following circular (letter B) to the town clerks of all the towns in the State:

## (CIRCULAR B.)

FROM THE OFFICE OF THE R. I. STATE BOARD OF HEALTH.

*To the Town Clerk of*

1. How many undertakers in your city, or town?
2. How many make returns as provided in Sec. 8, Chap. 77, of the General Statutes, and as amended by Sec. 8, Chap. 488, of the Public Laws?
3. What proportion have physicians' certificates appended?
4. Have delinquents ever been notified, that complaint would be made for neglect of duty, as provided in Sec. 11, Chap. 77, of the General Statutes?
5. If deaths are not reported by undertakers, how are they ascertained for the Annual Returns?

6. Has your town a Board of Health acting separately from the Town Council?
7. How many Health Officers are appointed by the Town Council or otherwise?

N. B.—Please reply by the numbers on the Postal Card, corresponding to the number of the questions.

C. H. FISHER, Secretary.

#### STATEMENTS OF TOWN CLERKS IN REPLY TO CIRCULAR B.

In answer to question Number 2, the clerks of thirty towns in the State, replied that few or no returns were made by undertakers, as provided by law, but in reply to question Number 5, that the returns of deaths were collected by the town clerk or some other authorized person during the months of January and February, in the year succeeding that in which the deaths occurred. It is easy to see how imperfect the collection of returns of the deaths in those towns for the whole preceding year must be.

In some cases the decedents are merely visitors or sojourners in the town, and if the facts of the case are not ascertained at the time of death, they can never be afterward. Again, many families in which deaths have occurred, have removed before the end of the year into another town, or out of the State, and therefore no account, or no correct account of such decedents can be obtained. In all of these cases the record of death is lost, for if the family in which a death has occurred in one town, is called upon by the collector of death returns in another town where they then reside, and statement is made to him of such death, it is of no account to him, as he is not required or expected to obtain returns of deaths that have occurred in another town.

In reply to question Number 3, twelve towns were reported, where no physicians' certificates whatever were appended to returns of deaths. In other towns the proportion having physicians' certificates attached, were given as one-eighth, one-quarter, &c., up to all where a physician was in attendance.

In relation to notifying delinquents, thirty-one towns answered in the negative to question Number 4, and twenty-eight towns replied no and none to questions 6 and 7.

It is needless to comment on the unreliable character of death returns for sanitary study, in which the causes of death are given by persons having very little knowledge of disease, and many times, a year after the occurrence of death.

By statute law, it is made the duty of the physician in attendance, to report every case of death at the time of its occurrence.

This is the only right time, because then, the character of the disease and all the attendant circumstances are fresh in his mind. Efforts will be made during the ensuing year to bring about a more prompt compliance with the Statutes, in relation to physicians' certificates of deaths, as well as to undertakers' returns. In furtherance of that object, the following circular (letter C,) was sent to all the town councils and town clerks in the State:

### (CIRCULAR C.)

FROM THE OFFICE OF THE STATE BOARD OF HEALTH.

PROVIDENCE, December 2, 1878.

*To the Honorable the Town Council and the Town Clerk of the  
Town of*

GENTLEMEN:—You are already aware that by the Act of the General Assembly establishing a State Board of Health, the manner of making the Annual Returns of Births, Marriages and Deaths, has been changed. The returns will now be made to the Secretary of the State Board of Health, and all blanks for that purpose can be obtained from him. It is expected every town clerk will comply with the law, as provided in Section 1, Chap. 77 of the Revised Statutes, especially when duly certified returns are made "accompanying the same, *with a list of those individuals, required by law to make returns to him, who have neglected the same.*"

It is hardly necessary in this connection, to call your attention to the great value of correct registration, of the births, marriages and deaths in your town. In their civil relations, affording definite evidence as to legal consanguinity, and rights of inheritance or entailments, rights and claims for pensions, insurance, or hereditary annuities. In their social relations, as a record and evidence of the public spirit, the moral tone and the disposition for associated interest, manifested at different periods of time. In their sanitary relations, though usually less apprehended they are no less important. Indeed, without them sanitary improvement would be greatly impeded. Without a record of births and deaths, the bodily vigor, the relative longevity, the average healthfulness, the tendency to particular diseases in any community, could scarcely be determined.

By such record, a clue to the laws of life and health is furnished. Such statistics afford the sanitarian, standing ground for observing the effects of localities, conditions, employments and circumstances of life, as causations of disease and sources of mortality. But, for *exact conclusions* there must be *correct returns*. False premises lead to defective and deceptive deductions. Incorrect returns lead astray. An investigation of the methods by which the registration returns



of this State have been obtained, and an examination and comparison of the returns so obtained, show that in some towns they are very inaccurate. The number of births returned from a town, have been less than the number attended by one practitioner of medicine in the town. Great negligence has also been practiced by undertakers and physicians, in regard to the returns of deaths. Attention is called to Sec. 12 of Chap. 77 of the Statutes, with the hope that every town council will require a record of the names of all the classes therein named, and give due notice to the same, that their duties as set forth in Sec. 4, Sec. 6 and Sec. 8 of Chap. 77, must be promptly performed.

The supply of blank returns of deaths, in the office of the Secretary of State have been exhausted. I have therefore ordered a sufficient number printed for present use, which will soon be ready at this office, for meeting the orders of Town Clerks and others therefor. In ordering the new blank death returns I have taken occasion to add, on the back of the same, additional sections of the law, in relation to making returns, and also a notice, that the Secretary of the State Board of Health, had been instructed to make complaint of violations of the law. I have also for greater accuracy and definiteness, particularly in the physicians' certificate, added more interrogatories. There is an important end to be gained by full replies to the questions, and it is very desirable that all engaged in filling out the returns, should feel a deep interest in making them as valuable as possible.

The necessity of vaccination, should also receive the attention of the Town Councils, as a means of stamping out one of the greatest scourges of the human race. The way of performing the operation in the school houses of the country towns, as it is usually practiced, hardly meets all the requirements of the case. In some instances not more than two or three are ready for the operation, while there may be five times that number in the district wholly unprotected by adequate vaccination, and the same proportion holding for larger numbers. It is important that some more effectual way should be devised. Town ordinances could be enacted to meet the difficulty.

Let no child go into the public schools, who cannot show proof of thorough vaccination, by physician's certificate, or otherwise. When the agent of the town canvasses for the School Census, as provided in Chap. 693 of Public Laws, or for returns of births, a very slight additional labor, would determine how many persons in the town were unvaccinated, and such knowledge would aid in devising means for the more effectual performance of the work. The *spirit* as well as the *letter* of the last four sections of Chap. 74 of the Statutes, should be thoroughly carried out. The present facilities for obtaining bovine virus fresh from the udders of the cow, obviates all objection heretofore urged against vaccination, as a possible means of the transmission of morbid humors, from one person to another.

It is suggested as a matter of importance, that in those towns where it is not already accomplished, one or more competent physicians should be appointed to act as the local or town board of health, subject to the authority, and in place of the town council.

Professional men whose training, and whose experience, have especially fitted them to be competent judges of what is prejudicial to the public health, can surely be more safely relied on for judicious application of the sanitary laws of the State, than those having no such knowledge.

All matters coming within the jurisdiction of the first six chapters of Title XIV, of the Revised Statutes, and all additions and amendments thereto, should therefore have professional administration.

It is hoped, and believed, as well as earnestly desired, that the local boards of health of the several towns, however constituted, will cordially coöperate with the State Board of Health, in the work of investigating the causes of disease, whether general or local, and thus secure within a reasonable period of time the prevention of a considerable amount of dangerous sickness, in the various communities, and a perceptible decrease, in the tables of mortality.

Very respectfully,

CHAS. H. FISHER, Secretary.

Since the above circular was sent to the town councils of the different towns, it has been noticed in the reports of the proceedings of several of those bodies, that they have ordered notice to be given to all parties concerned, that they must comply with the statutes, in relation to the returns of marriages and deaths.

Such measures should be taken by every town council in the State, for it is incumbent upon them to make the duties set forth in the laws of vital registration, obligatory on the part of those of its citizens who assume positions described therein.

The interrogatories added to the last issue of blank returns of deaths will find no column for them in the record of death returns, which is retained by the town for its own use, nor would the record of those sanitary questions be of value to the town were these blank records furnished for the purpose. They are of great interest and value, however, to investigators of the causes of disease, and the State Board of Health hope to have the returns properly filled, and as neither the town record, nor the record heretofore transmitted to the Secretary of State, have blank columns corresponding to all the questions, the Secretary of the Board, as heretofore suggested, will furnish blank records of smaller size for those additional questions, to the town clerks of all the towns, previous to the time when they will be needed.

It may be observed that the questions in the blank returns of deaths used for two or three years past, have not all had blank spaces for their separate entry on the town and State general records, and have therefore been of no increased value for sanitary study.

The form of returns of deaths just issued, will be found on the following pages:

[FACE.]

## RETURN OF A DEATH.

STATE OF RHODE ISLAND.

1. Date of Death.....	.....187
2. Name in FULL?.....	.....
3. Age?.....	..... Years..... Months..... Days
4. Place of Death?.....	.....
5. Street and No?.....	.....
6. Sex?.....	.....
7. Color? .....	.....
8. Condition?.....	.....
9. Occupation?.....	.....
10. Place of Birth?.....	.....
11. Father's Name?.....	.....
12. Mother's Name?.....	.....
13. Parent's Birthplace? Fa.....	..... Mo.....
14. Where Buried .....	.....

INFORMANT.

N. B.—At No. 4, give city or town and village. At No. 5, if no street, state what part of school district. At No. 8, state whether married or single, widow or widower. At No. 13, state the country in which each parent was born.

## PHYSICIAN'S CERTIFICATE.

1. Name?.....	.....
2. Date of Death? .....	.....187
3. Disease? Primary.....	.....
4.       "       Secondary.....	.....
5. Immediate Cause of Death?.....	.....
6. Sanitary Surroundings: Good?..... Bad?..... Average? .....	.....
7. Duration of Disease? Primary.....	.....Secondary.....

PHYSICIAN.

N. B.—At No. 5, state whether from exhaustion, paralysis, suffocation or what. At No. 6, state yes or no to the questions. For out doors make sign, + over reply. For out and in both make sign, —.

*I certify that the above is a true return, to the best of my belief.*

UNDERTAKER.

18

[REVERSE.]

EXTRACT FROM CHAPTER 77 OF THE GENERAL STATUTES OF 1872, "OF THE REGISTRATION OF BIRTHS, DEATHS AND MARRIAGES," AS AMENDED BY CHAPTER 488, PASSED MAY SESSION, 1875.

SECTION 2. Section 6 of said Chapter 77 is hereby amended so as to read as follows: "Whenever any person shall die, or any still-born child shall be brought forth in this State, it shall be the duty of the physician attending at such bringing forth or last sickness, if any physician so attended, within forty-eight hours after such death or bringing forth, to leave with the family, if any, or person having the care of the deceased or the person bringing forth such still-born child, or to give to the undertaker or person who conducts the funeral, a certificate stating, in case of a death, the name of the deceased, the date of the death and the disease or cause of the death, and in case of the bringing forth of a still-born child, the date and the cause of such child being brought forth still-born."

SEC. 3. Section 8 of said chapter is amended so as to read as follows: "The undertaker, or the person who shall conduct a funeral, or who shall bury or deposit in a tomb, or who shall remove from this State or otherwise dispose of the remains of any deceased person or still-born child, shall first obtain the physician's certificate required by Section 6 of this chapter, if a physician was in attendance upon such person who has deceased, or the person bringing forth such still-born child, and shall return the same, together with his own certificate of the facts required by Section 8, as hereby amended, on or before the second Monday of the next succeeding month to the clerk of the town where such death or bringing forth took place."

SEC. 11. If any clergyman, physician, undertaker, town clerk, clerk of any meeting of the Society of Friends, or other persons, shall willfully neglect or refuse to perform any of the duties imposed on, or required of him, by this chapter, he shall, at the discretion of the court trying the cause, be fined not exceeding twenty dollars for each offence, one-half thereof to the use of the town in which the offence shall occur, the other half to the use of the person who shall complain of the same.

SEC. 12. In order that it may be more surely ascertained, that no clergyman, physician, undertaker, coroner, or clerk of the Society of Friends, neglects to make the returns specified in this chapter, each of the said parties shall cause his name and residence to be recorded, in the clerk's office of the town where he resides.

N. B.—For the purpose of securing more correct registration of deaths, the Secretary of the State Board of Health is instructed to make complaint of any violation of the law in relation thereto. Incomplete returns will be returned for correction, unless the reason therefor is given on the return.

How best to secure complete returns of all the deaths in the State, and obtain accurate accounts of the causes of death, and the circumstances surrounding all cases of preventable diseases, is the great question for solution.

It seems, however, very evident that at least one additional provision can be made to our vital registration laws, which will go very far toward remedying the evil of neglect in the return of deaths, and especially of cases not attended by a responsible physician or buried by an undertaker.

And that is the requirement of a burial permit before interment, in every case of death, or a removal permit if such is desired, in all the towns in the State, the same that is required in the cities and some of the more thickly settled towns.

These permits might be granted by town clerks, and all members of town councils, all health officers of a town, and if in the judgment of the town council, thought advisable for convenience, the trustees of school districts, all of whom should be required to make report of the same.

#### PLANS OF WORK.

It is the design of the Secretary of the Board to endeavor to obtain from physicians and clerks of local boards of health in all the towns in the State, a MONTHLY STATEMENT of the diseases most prevalent in their respective localities, during the month, together with the general degree of severity, and the comparative mortality; the rainfall; the condition of the soil in regard to moisture or aridity, during the month, and different weeks in the month; the average temperature of the atmosphere, whether the weather has been subject to sudden changes, and the degree of change, the condition of vegetation (if in the warm season) as to luxuriance or feebleness; the fruit, potato, cereal and grass crops in particular, as to mildew, mould, rust, smut or blight; the prevalence of any unusual kind of sickness, with its characteristics and rate of mortality; the relative amount of general or particular sickness, with proportionate death rate, compared with the average of the corresponding month of previous years; the noted absence of ordinarily prevalent diseases of the month, together with statements of facts regarding the prevalence of contagious diseases occasioned by communicability, and suggestions as to the causes of general or particular diseases, and especially those causes of disease

which are believed to be removable. Such statements of facts as are suggested above, from a single small area of observation would, as elsewhere remarked, be of little value, but reported from many locations, and comprising all the towns in the State, will, when properly classified and arranged, become a valuable basis for sanitary study and generalization, and afford great aid in the suggestion of other and better methods, for the observation and detection of new facts.

Sanitary observations must necessarily extend over a considerable territorial area, comprising cities, towns, and villages, neither of which alone can furnish all the facts absolutely needed for full generalization.

In order to secure the coöperation of intelligent observers in different sections of the State, and especially such as by professional culture and experience, are better fitted for sanitary observation, the following circular (letter A) was sent to a considerable number of the medical profession, of prominence in their respective localities, and embracing all the towns of the State:

(CIRCULAR A.)

OFFICE OF THE STATE BOARD OF HEALTH,

17 COLLEGE STREET, PROVIDENCE, R. I.

DEAR SIR:—The Rhode Island State Board of Health, desires reliable correspondents among practitioners of medicine, in all the sections and localities of the State. The work required of correspondents, will be replies to such circulars of inquiry, as may be sent to them, and statements of facts concerning the presence, and presumable causes of disease, which have come to their knowledge. It is especially desired, that the prevalence in any locality of severe forms of zymotic diseases, and any suspected cause or causes of such diseases, endemic or epidemic, should be promptly reported, and at least semi-monthly reports continued, during the prevalence of such diseases, to the Secretary of the Board.

It is the intention of the Secretary, to prepare a *Sanitary Map* of the State, which will show not only the chorographical outlines of towns and school districts, but also the topographical and geological features and characteristics, of sections of cities, and school districts. It is desirable to learn the location, in all sub sections, of the natural ponds, drainable reservoirs, swamps, marshes, streams of water of any considerable size, etc., etc. Correspondents may therefore be called upon for a description of their section of territory. Envelopes and blanks will be furnished, and all postage expenses defrayed by the Secretary. Abstracts of such replies, statements, and reports, will form a part of the basis of the annual reports of the Board.

Correspondents who are unwilling their names should be used as contributors, should so state at the bottom of every report or reply, which they desire should be confidential.

In return, correspondents will receive all the Annual Reports of the Board, the Annual Registration Reports, and all circulars for popular dissemination of sanitary knowledge. They will also, thereby, discharge a just duty to their patrons and the State.

If, therefore, you feel disposed to aid the Board in the work of investigating the causes of disease, and acquiring a knowledge of the means of prevention, and are willing to be placed on the list of regular correspondents, of the State Board, you will please write your name and P. O. address on the enclosed postal card, and transmit to the Secretary by mail.

CHAS. H. FISHER, Secretary.

In response to the above circular, about sixty members of the medical profession signified their willingness to act as regular correspondents of the Board. Every one of these individuals, is a person of responsibility and high intelligence, many of them occupying positions of trust and honor, in their respective towns, and together they represent every section of the State. Upon them great reliance will be placed, in regard to the reports and statements, which it is expected they will make from time to time to the Secretary of the Board.

#### REGISTRATION OF DISEASE.

The *registration of disease* from carefully recorded returns, must, in the not far future, become a valuable help in ascertaining the laws of life, of health and disease. Notwithstanding, such registration has not hitherto been successfully accomplished, or indeed very earnestly attempted, it must, in the nature of things, be of especial value, when properly performed; *i. e.*, with careful statement in the returns, all the attendant circumstances of constitution and condition of soil, where disease occurs, the surrounding circumstances in regard to the presence or absence of filth, the house, surface, and soil drainage, the source and quality of the drinking water, the internal condition of the dwelling and cellar, including the means of ventilation, lighting and warming, the arefaction of bedding, clothing, walls and floors; whether dwelling of brick, wood or stone; habits of family, habits of invalid; occupation of invalid and condition of place of labor; diathetic condition of invalid and connection with previous diseases.

## SANITARY OBSERVATION.

Sanitary observation and inquiry with a record of the same for report, as suggested above, will, without question, in the not far future, enter more largely into the daily practice, of the intelligent and qualified practitioner of medicine, as a means of ascertaining the cause and nature of the diseases with which he is contending. A report of the facts obtained by such inquiry and observation from a large number of intelligent practitioners, classified and tabulated, would afford a valuable means of comparison, and help dispel the mists and darkness that have hitherto hung over so many obscure maladies. It may seem like groping in the dark, but it must be remembered, that much of what is positively known, as scientific knowledge, has been reached, only by groping blindly through many devious ways, and over many stumbling-blocks. In the discovery of the causes of many diseases, we are, and shall hereafter be obliged, to proceed from the known to the unknown; by comparison of known facts, we come in possession of definite propositions, and reasonable premises for the deduction of logical inferences, just as the astronomer, by the perturbations of some celestial body, infers the existence of some other body of like character in its immediate vicinity, and thus, moved by his reasoning, makes persistent search, and is rewarded by the discovery of the previously unknown or unseen body.

It is a common observation among physicians, that locations vary greatly in the peculiar characteristics they give the diseases occurring in them, not the endemic alone, but frequently, distinctive characteristics among the manifold types and grades of common diseases, which, if not apparent, are reasonably believed to be dependent on some local cause unknown. These characteristics in many cases, make all the difference between life and death. Will it be said the causes of such characteristics cannot be discovered? or if found cannot be removed?

It has seemed to me, that in order to determine with any fair degree of exactitude, the influence of local conditions upon the production or virulence of disease, especially such as might be dependent on the natural features of any location, that there should be a sanitary survey of the State, chorographical, topographical and geological. Such a survey would result in the production of a set of



## SANITARY MAPS OR CHARTS

of every township in the State. Each township should be divided topographically into sections; wards in cities, and school districts in towns where they exist would answer very well. On these maps should be shown the geographical features, the boundaries of sea-coast and tide-water, when existing; the course of rivers, the ponds, the ranges of hills and their altitude and direction, the large plains, the deeper valleys, the low wet lands and swamps, the forests and wooded lands. The topographical features should show the location of villages, the location, size and kind of manufacturing establishments, the boundaries of wards in the cities and school districts in the towns.

With a township map, say two by three feet in dimensions, having the foregoing specifications for a basis, the geological formations may be designated by various transparent colors, and with dots, or lines with different inclinations to distinguish surface soil, subsoil or underlying rock. Arbitrary characters, letters and figures, may be used to denote the average humidity or aridity of the soil, the source and kind of water supply, the facilities of surface or sewer drainage, the location of special deposits of vegetable and animal refuse and excreta, and such industrial establishments as are believed to be detrimental to the health of the public in their immediate vicinity.

Reports from physicians of disease or death, with a few facts connected therewith, stating what part or location in any certain town section, school district, village or ward the disease or death occurred, and received by some officer appointed for that purpose, and with the map before him, could be easily classified and compared, in connection with the geological formations and conditions, and the local surroundings. By such an arrangement the physician would be relieved of a very considerable amount of irksome labor, and could with very little time and attention, report every month upon the back of a postal card having upon it printed questions for the purpose, the said postal to be furnished by the State free of expense. The summing up of the facts, derived from such reports for a series of years, must certainly furnish very reliable data, for deducing conclusions in regard to many of the vexing problems, now presented the profession for solution.

By reports like those alluded to above, and by returns of deaths and causes of deaths as now and may be hereafter required by law, the physician can serve beneficently the State, and meet one of its just claims, and also serve humanity.

## DISSEMINATION OF INFORMATION.

It is the purpose of the Board to "publish and circulate from time to time, such information as they may deem to be important and useful for diffusion among the people of the State, in such form as shall be least expensive, and reach the largest number of citizens. In pursuance of the same, there was prepared and published in the month of June, ten thousand copies of a four page tract, which was as follows:

## OFFICE OF THE STATE BOARD OF HEALTH.

## PRACTICAL SANITARY HINTS.

## PUBLIC HEALTH TRACT NO. 1.

The advancing heat of summer warns us to take reasonable precautions against the advent of those destructive diseases of the season, that every year carry so many into untimely graves.

These diseases: Diarrhea, Dysentery, Cholera, Cholera Morbus, Cholera-Infantum, Typhoid Fever, etc., are almost wholly affections of some portion of the intestinal canal. Such being the facts, the natural inference would be, that they were caused by some errors of diet and regimen. While it is true these play a very important part in the production of disease, there are other morbid materials, which, absorbed into the body by the lungs or skin, or taken into the stomach, become equally active agents directly or indirectly, in the causation of disease. Among them are the noxious gases, gaseous poisons and disease germs or particles, that float in the atmosphere or in the water we drink. Now, whether disease arises from the inception of minute living germs, or poisonous inorganic particles, or poisonous gaseous fluids, it is known beyond question, that whatever the agents are, they may and do emanate from fermenting and putrifying decomposition of animal and vegetable refuse.

## FILTH,

wherever found, on the surface or in sewers, soil pipes, sink drains, cesspools, privies, pigsties, house yards, courts, alleys or cellars, is a prolific head source of much of the suffering and disease that affects humanity. The destructive influences of the effluvia of decomposing filth, have been far too little known, and therefore too little regarded, by the general public. While from their baneful effects none are exempt, their direct influences are visited upon those of least vital resistance, namely, children and invalids. The heat of summer greatly favors decomposition of all refuse matter, and many a child and invalid, will be laid away in the graveyard, during the present heated period of the year, the victim of summer disease caused wholly or in part by the gases of putrifying filth. We rush to the rescue of drowning men, we intercept the blind walking toward the

edge of a wharf or precipice; why neglect to rescue the multitude from death little less certain, and much more painful and lingering?

In the cities with compact population great care must be taken to *remove wholly* all manner of decaying rubbish, garbage or vegetable refuse to places where it may be out of harm's way, or be utilized or reduced to ashes. Removal is far better than disinfection, which is quite uncertain, and deodorization, which is in most cases more or less incomplete. Heating or burning is the most absolutely effectual appliance. Where high degrees of heat cannot be applied, and frequent removal is impossible, then deodorizers and disinfectants must be freely employed, every three or four or more days as occasion may demand.

#### USE OF DEODORIZERS AND DISINFECTANTS.

A few only of these agents need be named. For privies, cesspools and open sink drains, one pound of Sulphate of Iron (green vitriol or copperas) to one gallon of hot water should be freely applied to every inch of surface, with a whisk broom or sprinkler, or a coating of wood ashes, or sifted hard coal ashes, perfectly dry from time of burning, should be as frequently applied as suggested above. These articles are nearly, and perhaps quite as effectual as any others, and have the advantages of extreme cheapness, perfect safety in use, freedom from odor, and convenience of obtainment everywhere. One pint of Liquor Chloride of Zinc in two gallons water, in one pail, and one pound of Chloride of Lime in another pail full of water, applied as above, the second immediately after the first, will very nearly if not effectually destroy all the odors of putrefaction. One pound of crude Carbolic Acid (sold in pound cans) to twenty gallons water, used in the same way, will produce like results. The Carbolic Acid solution just mentioned, one gallon added to the Sulphate of Iron solution two gallons, will make a very effectual application. And so also the Chloride of Lime solution followed by the Sulphate of Iron solution. The Liquor Chloride of Zinc, having no odor of itself, makes a very agreeable as well as effectual wash for deodorizing sinks, sink spouts and closed sink drains; should be used, one pint to three or four gallons of water.

Most of the solutions above named will corrode tin vessels, if kept in them long, destroy colors of cloths or paints upon which they remain in contact, and the copperas will spot white and colored cloths, and white colors generally, all of which may be avoided by care. Earthen or unpainted wooden vessels should be employed for large or long use.

#### VENTILATION OF SOIL AND SEWER PIPES.

All closed cesspools, sink or soil drains and sewer pipes, should be ventilated outside the house, by ventilating tubes or pipes opening above the eaves. Water traps of every kind have been found insufficient, in any kind of unventilated pipe or sewer, to prevent the inflow of poisonous gases, by permeation through the fluid of the traps, from the expansive force of the gas, and the lighter air of heated rooms.

Outside the cities and more compact and larger villages, the dangers from the effluvia of cesspools, privies and other out-door decaying filth, are commonly supposed to be less, because more widely separated, and more largely diffused

and dissipated in the common air; but if these were facts, they by no means imply the absence of danger, or exemption from the necessity of the employment of the same measures recommended above; because, while the effluvia of filth may be so diluted by large volumes of pure air as to be practically less observable and perhaps less harmful, except when in its immediate current, there is another danger, less suspected but not less deadly in its noxious effects.

#### CONTAMINATED WELL WATER.

There is death in the well. Subtle poisons may lurk in the well water, unperceivable to sight, smell or taste. Wells, it must be borne in mind, drain an area of surface around them, in ordinary soils, of a distance equal to their entire depth, and may drain directly from sources of pollution a distance of many times their depth, by strata of rock or clay, inclining toward them, though the surface drainage or inclination may be away from them. It will be evident that the danger will be very considerable, from privies, cesspools and all other collections of putrifying filth within a distance at least equal to the depth of the well, which are either upon the surface, or nothing but openings or holes or depressions in the soil, subjected to the heats of summer, and leached day after day by rainfalls and the usual fluids, the resulting polluted and pestiferous lye, percolating through the underlying earth down to the bottom of the well. While soils are to some extent the natural filterers and purifiers of water, some are but slightly such, and none can wholly filter out the subtle poisons that result from putrefactive decomposition of accumulated filth. For such accumulations, until better arrangements can be made, prompt and frequent removal and complete disinfection while remaining, are imperatively demanded for safety to life. On premises where no abundant water supply is obtainable, with free drainage by sewerage, by which all night soil, house refuse and filth may be completely conveyed beyond harm, all privy vaults, cesspools and other receptacles of filth should have free ventilation and be water tight, their contents kept from fermentation by dry earth, dry unleached ashes or copperas, or carbolic acid solution, and their contents proquently removed. Barrels that are strong and tight may be cut in two in the middle, and each half used, slid beneath or hung inside of privy vaults, or watertight boxes of size requiring frequent removal, used in the same way. If the contents are to be used for fertilization, the carbolic acid solution should be omitted.

#### UNCLEANLY CELLARS.

There is another source of danger to life in the cellars. Death has come through the cellar to slay thousands upon thousands. Cellars with soil bottom must of necessity be damp, because like wells they drain the earth around them. Cellars that retain water for some weeks and are muddy a considerable part of the year, are among the most hazardous of household dangers. There is a kind of exhalation from the earthy bottom of such cellars, independent of any filth, called ground air, which is very detrimental to human health and especially promotive of pulmonary consumption. All cellars should be kept dry as possible by thorough drainage. But the warmth and moisture of all cellars, however well drained or cemented or both, favors the decomposition of the refuse of storage

vegetables, and whatever droppings there may be of meats, butter, lard, cheese, or other animal products, and which emit gases dangerous to life. A prominent physician reports the occurrence in the north part of the State of twenty-seven cases of severe typhoid fever, some of them fatal, the direct result of the unhealthy influences of a damp and uncleanly cellar.

To prevent the emission of ground air or soil moisture from the cellar bottom or sides, the sides must be laid in good hydraulic or asphaltic cement, and the bottom in the same, or in alternate layers of asphaltic cement and felt saturated with bitumen. Good ventilation, however, will greatly obviate the necessity of cementing, but absolute cleanliness is indispensable. As the warm season approaches, sweep up and remove every particle of refuse, let in plenty of light and air, wash the walls with a solution of copperas, (one pound to a pailful of boiling water,) first with a stiff broom and then with a mop, and finish with a thorough whitewash of lime.

#### NEGLECTED PROVISION CLOSETS.

Disease is also sometimes caused by half cleaned or neglected cupboards, closets, pantries, or provision rooms, where bits and crumbs are left to decay.

It is not necessary, however, that contaminated water, or the effluvia of surface or pooled filth, or uncleanly cellars or pantries, should be sufficiently poisonous, to produce *directly* and obviously the common diseases of summer, to be sources of danger; for other derangements of the human economy, varying with the constitutional peculiarities of individuals, may be as easily induced by the same causes; and in the absence of any or all acute diseases, it is quite probable that very many of the obscure ailments of numerous persons, not immediately dangerous, have the same origin, and are consequently so perpetuated; making the victim's life almost intolerable with aches and pains, and functional disturbances of the nervous system, the stomach, bowels, kidneys and other organs, almost endless.

The great, the indispensable remedy is cleanliness, and not only of inanimate but of animate bodies also, for filth is the same disease-producing agent, whether upon the surface of the earth, or in or about the habitations of man, or incrustated upon the surface of human bodies.

#### HEAT AS A CAUSE OF DISEASE.

Among other agents directly promotive of summer diseases, notwithstanding the apparent exceptions, high degrees of atmospheric heat hold an important place. The sudden advent or a long continued high degree of heat debilitates the nervous system and digestive organs of susceptible persons, and persons reduced by fatigue or other causes, consequently, indulgence in the same quality and quantity of food, ordinarily taken with impunity, would be oftener followed by indigestion and some form of derangement of the stomach and bowels, resulting in congestion or inflammation of a higher or lesser degree. The preventive is obviously a sparer, more nourishing and more easily digestible diet. Of the diseases of summer, Cholera Infantum is the one most fatal and most intractable. This disease seemingly holds a very steady and definite relation to high degrees, or sudden alternations of heat. The greatest care must be taken to adapt the

quantity and quality of the food of young children, to the varying conditions of the atmosphere. Instead of waiting until serious illness occurs to call the family physician, let him be called early, to prescribe, not drugs, but modes of management of diet, exercise, exposure, clothing, and personal cleanliness to meet the varying changes of the season; and among, and not the least of the duties of the physician, will be the sanitary inspection of the dwelling, the water used, and the surrounding premises. It seems hardly necessary to allude to the dangers of eating unripe fruits and vegetables, the drinking largely of iced beverages, exposure to damp and cool evening air thinly clad, or lying on the ground in cool places, and especially sleeping with insufficient covering in open rooms, subjected to the frequent sudden cooling of the night air. An ounce of prevention is better and far cheaper than a pound of cure.

This tract was circulated freely in every portion of the State, and by reason of the influx of summer visitors, at the numerous places of resort by the seaside, and on Narragansett Bay, found its way into distant States and cities, and many letters of commendation were received by the Secretary from parties in the middle and western States.

Several applications for packages of from fifty to one thousand, were received with tender of payment, but none could be furnished, as they had been distributed in the State. Leave was given in one instance to republish, to a party in one of the smaller cities of New York.

In November, the Secretary was authorized to prepare the manuscript of another four page tract. This was done, and at a subsequent meeting of the Board, the Secretary was ordered to procure the printing of ten thousand copies for popular distribution. This tract was as follows:

#### FROM THE OFFICE OF THE R. I. STATE BOARD OF HEALTH.

### RESTRICTION AND PREVENTION OF SCARLET FEVER, DIPHTHERIA, SMALL POX, AND OTHER INFEC- TIOUS DISEASES.

#### PUBLIC HEALTH TRACT NO. 2.

*Good personal health*, is the foundation of individual enterprise and success. Individual health in the aggregate, is public health.

*Good public health*, is the essentially solid basis of national energy and prosperity.

*A nation of invalids is already in its decline.* A nation of universally able-bodied citizens, in the fullness of physical and mental health may defy adversity.

*How to prevent the occurrence of disease, and acquire, and preserve good health, is one of the most important studies of modern times. It is not only engaging the attention of the Medical Profession, but also that of advanced and thoughtful minds in every community.*

Fortunately it is one, in which every intelligent individual can readily engage, and also one, which every person is under imperative moral obligations to pursue.

*No person can rightfully allow himself, his family, or his neighbor to become sick, when such sickness can be prevented by reasonable precautions.*

*The design of this tract is to show in what way, many cases of contagious disease, may be prevented from spreading through a whole community, or lighting up the disease at some future time or in some distant place, by restricting the infection to the original cases.*

*The directions given will have particular reference to Scarlet Fever. This disease is also popularly known under the different other names of Canker Rash, Scarlet Rash, Putrid Sore Throat, Scarlatina, etc., all and singular of which are produced by one and the same poison, and are capable of reproducing the same, and consequently infecting other persons with the same disease.*

It is not a long time since prominent physicians had doubts of the contagiousness of Scarlet Fever. The proofs of communicability, have however so multiplied in a few years of close observation and investigation, that the question seems now to be definitely settled.

*Scarlet Fever is caused by the introduction within the body through the lungs, stomach or skin, of specific poisonous particles of matter, or organic germs. Individuals vary greatly in their readiness to receptivity of the disease germs, and their susceptibility to the effects of the inceptive action. But whatever the degree of the disease, the same poisonous germs are reproduced, with equal power to produce the disease in other persons.*

*The excretions or waste material from the bowels, kidneys, skin, lungs, mouth, and nostrils, contain and carry out of, and away from the body, these particles or germs of the disease, which are so exceedingly minute in size, that they have never yet been detected by microscopic observation, and so light, as to float in the air for long periods of time, and for long distances, without having their poisonous qualities or vitality destroyed, by the moisture or dryness, the heat or cold, or the ordinary gases of the atmosphere.*

*These germs, by their exceeding lightness, may separate from any of the emanations from the body, either after having been thrown out upon the surface of the ground, and rising therefrom to be wafted away in the currents of the air, to infect some other person or persons, weeks or months afterwards, and scores of miles away, or, separating immediately in the sick chamber from the breath, perspiration, scaling off, or other discharges from the body, may rise and floating about in the room, infect some unwary caller, or find lodgment in some nook or crevice, or on some shelf, moulding, sash, ornament, curtain, drapery or other clothing, to be again dislodged from their resting places weeks, months or years afterwards, to affect some casual visitor or new occupant, or be carried away in articles of furniture, ornament, or wearing apparel, to spread infection and carry dismay to other persons, and in other localities.*

*Scarlet fever is one of the most fatal of contagious diseases.*

By the census of the United States for 1870, the mortality from this disease for the previous twenty years, is stated to average about one to every twenty from all other causes.

But it is needless to go to statistics, to prove the necessity of all reasonable attempts to check the progress of the malady.

When, therefore, it is ascertained, that a member of the family is affected with the disease, let the following directions be observed and carried out, as far as circumstances will permit, under the supervision, and modification, when needed, of the physician in attendance.

A close observance of them will be attended with considerable labor and inconvenience, but it must not be forgotten, that no person has a right to injure his own family, his neighbor, or his fellow man anywhere, by willful or indolent neglect of known duties.

1. *Entire separation of the sick from all other persons*, except such as are absolutely required for attendance and nursing. Nothing can compensate for this precaution, for the restriction of the disease, and the welfare of the patient.

2. *The patient should be taken to a dry, well ventilated, and properly prepared apartment.* An upper room is dryer, and safer as well as more airy than one near the ground. The thermometer should be kept between 68° and 72° F., as nearly as possible during the heated stage, and about 76° thereafter.

All furniture not really needed, all ornaments, pictures, books and maps, all valuable carpets, drapery or other cloth material that might be damaged by fumigation or disinfection, and all furniture upholstered with cloth, should be entirely removed.

All large furniture not removable except with great difficulty, may, however, be covered with paper, and the paper covered with cloth, all which can be carefully removed and destroyed after the termination of the sickness.

Pieces of carpet and old rugs may be used to cover the naked floor and disposed of as above, or disinfected by fumigation or heat. Fresh air should have free access to the room, special care being taken to protect the patient from currents or drafts, or sudden introduction of large volumes of air of lower temperature than that of the room.

3. *The bed provided should be elastic and cool.* Soft feather beds, or any into which the body of the patient sinks, are entirely inadmissible. Rubber sheets or other covering of firm material, laid over the bedding, drawn tight, and securely fastened to the sides of the bedstead, to prevent sinking down of the body, should be used when mattresses cannot be obtained. Rubber sheeting, properly applied, is a very effectual protection of the under bedding.

4. *Attention to cleanliness and disinfection is indispensable.* The body and bed linen, and all larger clothes, should be frequently changed and immediately on removal, immersed in vessels containing a disinfecting solution, (Liquor Sodæ Chlorinate one quart, water four gallons,) which should be kept in or near the room for the purpose of retaining soiled clothes until opportunity occurs for thoroughly boiling for at least one hour.



*Heat above the boiling point, whether by boiling or baking, is a powerful disinfectant, and effectually destructive of contagion germs.* The clothing of nurses and attendants should also be disinfected before coming in contact with persons liable to infection, and the above precautions should be continued until the period of peeling or scaling of crumbled scurf skin has ceased. *These fine branny or mealy scales are especially dangerous as carriers of the contagium of Scarlet Fever.*

Cotton clothing is much better than woolen for use in the sick room, being less likely to entangle and hold the scales or germs of contagion, and also more easily disinfected.

The hands should be washed with Carbolic Acid Soap, or in diluted Chlorine Water, (one ounce to half pint of water,) or diluted Bromo Chloralum, (one ounce to half pint of water). The last is free from any odor. The body of the patient should be bathed at least once in twenty-four hours in the solution (Liquor Sodæ Chlorinatæ one-half ounce, water one pint,) until cessation of peeling.

5. *All the larger discharges from the nose or mouth, and all the stools and passages of water, should fall into vessels containing at least a half pint of a solution of green copperas, (one pound copperas to one gallon of hot water,) and carried at once to some distance from the house and covered if possible with a light coating of dry earth. Keep out of streams of water, and away from the vicinity of wells. If water closets or privies must be used, let them be frequently and thoroughly disinfected. (See Public Health Tract No. 1.)*

*Good napkins and handkerchiefs should not be used* for the smaller discharges from the mouth and nose, but instead small pieces of cotton cloths, which may be burned immediately after use.

*While good ventilation is indispensable in the sick room, some benefit may doubtless be derived from the diffusion therein, of some disinfecting gas like chlorine or ozone. Saucers partly filled with Chloride of Lime may be set in different places in the room upon which a teaspoonful or two of good sharp vinegar may be turned every three or four hours. The Lime should be renewed when it ceases to give off the gas. Cloths may be wet with Liquor Sodæ Chlorinatæ (one part to three of water,) or if Chlorine gas is very offensive to the patient or attendants, the cloths may be wet with the Bromo Chloralum, which is without odor, (one part to four of water,) and hung up in different parts of the apartment.*

6. *After the complete termination of the disease, all the contents of the sick chamber, all the material of every kind whatever, used during the sickness and remaining in the room unprotected, and the floor, walls, windows and ceiling of the room should be thoroughly disinfected by washing, fumigation or heat. Whatever is of small value had better be burned. The rooms should be washed thoroughly in every part with the following solution: (Sulphate Zinc, half a pound, crude Carbolic Acid one ounce, hot water, two gallons.) When practicable, the walls and ceilings, should be lime washed or kalsomined.*

To fumigate a room with Sulphurous Acid gas, the contents must be so arranged that the fumes may come in contact with the entire surfaces of all the articles to be disinfected, as well as sides of the apartment.

Across a tub partly filled with water, place a pair of tongs or other support, for an iron basin or skillet, or thick earthen pan. Put in the basin or pan, a layer of ashes one inch thick, then a few bright live coals, upon which scatter at least one pound of powdered or crushed sulphur. Close the apartment tight, and leave for twenty-four hours. Then ventilate freely.

To disinfect with heat alone, large ovens must be used, and the temperature carried up to a degree, at which bread would be rapidly baked, and continued for one hour.

*In case of death, the body should be wrapped in large cloths, thoroughly saturated with a strong solution of Chloride of Lime or Soda and placed in a coffin as soon as possible.*

*Funerals of persons dying of contagious diseases, had better be held elsewhere, than at the residences of the deceased, and an open coffin should never be allowed.*

Whenever a virulent contagious disease occurs in any community, it is the duty of all citizens to cooperate with the afflicted family, in repelling the attack of the invader, and confining the disease to the first cases.

*To avoid attacks of infectious diseases, the directions suggested in Public Health Tract No. 1 should be strictly observed. Breathing air containing sewer gas, or any gases of decay, or exhalations from any form of filth, in cesspools, water closets, sinks, foul cellars, or uncleansed animal bodies, or repeatedly re-breathing one's own breath, or the breath of others in closed rooms, especially in closed bed-rooms through the night, are unfailing sources of deterioration of general health, and whatever impairs general health, lessens the natural vigor of the individual, lessens the power of resisting the attacks of any disease, and especially predisposes to attacks of infectious maladies, like Scarlet Fever and Diphtheria, and also greatly increases the liability of death.*

While the above suggestions have particular reference to Scarlet Fever, many of them will apply equally well to other forms of contagious diseases. Small Pox preëminently, requires the same management.

Paragraphs numbered one, two and three, are applicable to nearly all forms of dangerous maladies, while the first section of paragraph 5 has especial applicability to typhoid fever, and nearly all will apply equally well to diphtheria.

Doubtless some will question the necessity of such sweeping precautions, but it may be suggested that to the neglect of such precautions, may be due in a great measure, the continued existence of infectious diseases, whether in isolated or in epidemic visitations, and if preventable diseases are ever to be stamped out of existence, it can be accomplished only by such vigorous measures, as will effect the destruction of the disease producing germs, in their infancy.

The word "*germ*" was used in the above tract, as being probably the best, to convey to the mind of the average reader, the idea of a

minute material particle or atom, which is the individual contagium, whether organic or inorganic, that causes the disease, and not as a *vital organism* whose existence has been demonstrated.

This tract will doubtless challenge criticism. It is hoped it will excite sufficient interest to lead to extended investigation. It was written with deliberation, with consultation of Reports of the Medical Officers of the Privy Council of England, and of many of the leading medical authorities of Europe and America. It will stand.

Other tracts may follow from time to time, and information will also be given by circulars or otherwise, to such parties as may seem, on account of official position, to need specific instructions.

## CATTLE COMMISSION.

Upon the organization of the State Board of Health, the duties that had previously devolved on that special board, known as the Cattle Commission, seemed to demand the most immediate attention. The alarming increase of that utterly incurable, and highly contagious disease called glanders or farcy, among the horses of the State, for the previous year or two, had called for prompt and stringent measures for its extirpation or restriction, and the former Cattle Commission, through several agencies, had been moving actively in that direction.

As elsewhere reported, the Board of Health resolved to continue the same agencies until further consideration, and the regulations adopted by the former Commission, were also adopted by the new Board as of their own.

These regulations were ordered to be advertised in several of the newspapers of the State, as had previously been done, and the advertisement was as follows:

## RHODE ISLAND STATE BOARD OF HEALTH.

## GLANDERS IN HORSES.

At a meeting of the State Board of Health held Monday, April 22, 1878, the following regulations were adopted and ordered to be published:

1. The owners of, or any person having the care of any horse or other animal, knowing the same to have the disease called glanders or farcy, shall keep such horse or other animal apart and separate from all other horses or animals.

2. The owner, or any person having the care of any horse or other animal, knowing the same to have the disease called glanders or farcy shall not lead, nor drive, nor permit such horse or other animal to go in or over any public street, road, lane or highway in this State.

3. Any veterinary surgeon or other person who shall have knowledge of any horse or other animal that has the disease called glanders or farcy, shall report the existence and location of such case of disease, to some member of the State Board of Health within twenty-four hours after receiving knowledge of the same.

The penalty for failure to comply with the above regulations, as fixed by Section 8, Chapter 76, of the General Statutes, is a fine not exceeding three hundred dollars, or imprisonment not exceeding one year.

The first section of the same chapter provides that any person who shall knowingly expose a horse or other animal having any infectious or contagious disease

to other horses or animals not infected with such disease, shall be fined not less than one hundred dollars, nor more than five hundred dollars.

Section 7 provides that any person who shall sell or offer to sell any horse or other domestic animal known to him to be infected with any contagious disease, shall be fined not more than one thousand dollars, or be imprisoned not exceeding two years, or both, at the discretion of the court.

Subsequently, the cost of advertising was found to be assuming such large proportions, that some other and more economical way of bringing to the notice of the public at large, the regulations adopted by the Board, seemed to be advisable. At a meeting in which the subject came up for consideration, the suggestion was made that placards, posted in public places, like post offices, stores, livery-stables and repair-shops of various kinds, would be a quite permanent form of advertising, and less expensive than advertising through the newspapers, and the following resolution was adopted:

*Resolved*, "That the Secretary of the Board be requested to present for the consideration of the Board, at its next meeting, suitable suggestions as to the duties and purposes of the Board, for the information of the people of the State, and also condensed regulations in regard to contagious diseases dangerous to life among animals, to be printed on posters; also, to present samples and styles of posters most suitable for the purpose together with the prices of the same."

At a meeting of the Board on the week following, the Secretary presented a report as directed, and it was voted "that the regulations be adopted, and that they, together with the suggestions to the public in regard to the duties and purposes of the board, be printed, on posters as per samples presented by the Secretary, 500 on plain paper, 500 on cloth and 500 on card-board."

The order was carried out by the Secretary, and the posters read as follows:

#### STATE BOARD OF HEALTH.

*In order that there may be no misapprehension in the public mind in regard to the purposes of this department of State government, attention is called to the following sections of the Act establishing the Board :*

SECTION 8. The Board shall take cognizance of the interests of life and health among the citizens of the State; they shall make investigations into the causes of disease, and especially of epidemics and endemics among the people, the sources of mortality, and the effects of localities, employments, conditions and circumstances on the public health, and shall faithfully do all in their power.

tain the causes and the best means for the prevention of diseases of every kind in the State. They shall publish and circulate, from time to time, such information as they may deem to be important and useful for diffusion among the people of the State, and shall investigate and give advice in relation to such subjects relating to the public health, as may be referred to them by the General Assembly, or by the Governor when the General Assembly is not in session.

SEC. 4. The State Board of Health shall also investigate the subject of diseases among cattle or other animals, and perform all the duties which have been delegated to the Board of Cattle Commissioners in Chapter 76, of the General Statutes of the State.

The work proposed is large in scope and will require extended inquiry and observation. Large immediately beneficial results cannot reasonably be expected. The Board will, however, prosecute the work with all possible diligence. For the accomplishment of its purposes the Board will need the hearty coöperation, not only of physicians, but of intelligent citizens also, in every community. Circulars, each containing a series of questions, will, from time to time, be distributed to regular correspondents in every town in the State, and will eventually cover the whole field of inquiry. The range of questions will be large, and the replies, in all cases, must be the result of intelligent observation. All knowledge is the result of observation, the collection and collation of facts. Sanitary science is no exception. Observed facts elicited from all parts of the State in regard to the prevalence of certain diseases, the accompanying meteorological and geological phenomena, the local conditions as to haze, dust and filth, the decomposition of animal and vegetable refuse, etc., will furnish, when collected, arranged and compared, a basis for sanitary law and judicious sanitary action. It is believed that the Board of Health can become a most efficient arm of State service, and eventually save the State annually from one-quarter of a million dollars upward. To do this there must be an interest on the part of the people. Town boards of health and village health clubs must be formed. Forms of association and methods of investigation will be suggested for such organizations, by the Secretary of the Board when desired.

All persons are requested to communicate the existence of any and all facts or circumstances to them known, prejudicial to the public health, to some member of the State Board or Secretary.

The Board have adopted the following condensed regulations in regard to contagious diseases among domestic animals:

1. No person having the care or ownership of any horse or other animal, having the disease called glanders, or any other disease highly contagious and dangerous to life, shall sell or offer for sale, or permit any such animal to go into or be in any public lane or highway, or expose or keep any such animal within the same building, or within fifty feet of any other animal not so infected.

2. Any person having knowledge of any disease or any facts as set forth in the preceding section, shall report the same to some member of the State Board of Health in writing.

Notwithstanding the above regulations subjects the offender to a fine

not exceeding one thousand dollars, or imprisonment not above one year, or both at discretion of court.

The names and post office address of the members of the Board are as follows: David King, Newport; Elisha Dyer, Jr., Wickford or Providence; Charles H. Fisher, North Scituate; George W. Jenckes, Woonsocket; William T. C. Wardwell, Bristol; Albert G. Sprague, Centreville.

By order of the State Board of Health.

DAVID KING, Chairman.

CHARLES H. FISHER, Secretary.

PROVIDENCE, R. I., May 16, 1878.

It will be seen that the form and phraseology of the new regulations, differs from the others, in that they cover other diseases besides glanders, that the question of a party knowing a horse or other animal to have the disease called glanders, is left to be settled by evidence in court, and the penalties are given in a few lines showing the greatest amount of fine and imprisonment, for any one offence.

These posters were put up in conspicuous places in all parts of the State, and while the expense was less than advertising in the newspapers while that continued, the posters are still a standing advertisement in all the places where put up.

The occurrence of cases of glanders, in locations distant from the Secretary, or other agencies heretofore employed for their effectual disposal, led the Board to adopt the following rule soon after their organization:

"Any member of the Board is authorized, on information received, to order the examination of any animal suspected of having a contagious disease, dangerous to life; and has hereby also authority to order the killing and burying of any such diseased animal, when deemed advisable."

This rule has been of special convenience in several instances, and a saving of expense to the State.

In regard to the examination of horses suspected of having glanders, by veterinary experts, the following rule was adopted:

"The fee of two dollars shall be the maximum sum allowed for the examination of any horse, having or suspected of having the disease called glanders, and such sum for transportation as will cover the expense of nearest public conveyance thereto, except for such cases as shall seem exceptional in the judgment of the Secretary."

It has been suggested, that when any person had suspicions that a horse or other animal of which he was the owner, or had in charge, had glanders or other contagious disease, dangerous to life, he should at once obtain the opinion of some veterinary surgeon, or expert of recognized skill, and that the fee for such examination be paid by the State, as an inducement to early and prompt action. It is probable, however, that if arrangements were made with responsible experts, by which their fees for examining animals suspected of virulent and contagious disease, should be paid out of the State treasury, that there would be many persons who would discover in such arrangement the opportunity for ascertaining from the best veterinary skill, an opinion in regard to some other form of disease from which their animals were suffering, and that without personal expense. Even if the experts were forbidden to give any but negative opinions in regard to the maladies of animals examined, when not proving to have contagious diseases dangerous to life, there would still be opportunities for fraud unless with the restriction that all parties, suspecting their animals of having such diseases, shall apply to any member of the State Board of Health, or its Secretary, or the Agent of the Society for the Prevention of Cruelty to Animals, for an order for such examination. And that is practically the case now. For any person presenting an animal having suspicious symptoms of disease, dangerous to other animals, to any one of the parties above named, can obtain an order for an examination by a responsible expert, and that without expense to the applicant.

The great difficulty, however, in regard to glanders in horses is, that nearly all persons suspecting the disease in an animal which they own, not only do not wish to know the fact themselves, but are extremely anxious it should not be known to others. The intention is to trade off the horse as soon as possible, and realize something, or keep him at work as long as his work will more than pay for keeping.

Horses are sometimes bought by small traders, which are known or fully believed to have glanders, for the purpose of speculation. They are given rest, fed well, have the nostrils sponged with a wash that dries up the secretions temporarily, and are then brought into the market, each with a shiny coat, a clean nose, a good harness on, and attached to a respectable carriage, and some unwary buyer is victimized.

The idea of endangering the health of other animals, or the property of other persons has very little consideration.



## AGENCIES EMPLOYED.

As previously reported, the State Board of Health, in assuming the duties of the Cattle Commission, resolved to continue the agencies already employed by the previous Board of Commissioners, until further consideration. Notably among those who had called the attention of the former Commission to the alarming prevalence of glanders among horses, was Dr. N. A. Fisher, General Agent of the Society for the Prevention of Cruelty to Animals, and to him were the Commission chiefly indebted for the discovery of the cases of that disease which came to their knowledge. His position and occupation afford great facilities for that purpose. He was therefore desired by the Secretary of the Board, to continue to render the same assistance he had previously rendered the former Commission, which he readily assented to, and has to the present time, actively coöperated in many ways, to make the work of the Board as effective as possible. His report, dated January 5, 1878, is included in this report, as it gives information which will be of interest to a large number who have never seen the report then given, and is as follows:

R. I. SOCIETY FOR THE PREVENTION OF CRUELTY TO ANIMALS, }  
PROVIDENCE, January 5, 1878. }

EDWIN M. SNOW, M. D., *Chairman of Cattle Commission:*

SIR:—Last June we called your attention to the prevalence of glanders and farcy in the city and country. This led to the adoption of measures by the Commissioners to prevent the spread of the disease; and for this purpose you requested that the Agents of this Society should carefully investigate all cases reported to them, or that might come within their observation, giving directions how to dispose of them, and that a record should be kept of the same. This has been done, and the following report will show the results to this date:

But it may be well to state in the first place, that although our statute does not authorize us to interfere when animals are suffering from diseases of any kind, unless connected with them some act of cruelty is alleged, we have always taken particular notice of all cases of glanders or farcy, that have come to our knowledge, and have entered them in our records; consequently we are able to give some idea of the extent to which they prevailed during the six years preceding the last, and we find recorded in all seven cases, as follows: In 1871, none; in '72, one; in '73, two; in '74, three; in '75, one; in '76, none. Of these—all found in the city—five were destroyed, and two were got off into the country before the proper authorities could be moved to secure them.

The whole number of cases of glanders and farcy that have received the attention of the agents of this society from April, 1877, to January, 1878, is twenty-one. Of these, nineteen were killed; one was stolen away after he had been seized by the agent, and one was by permission taken to Massachusetts, where he came from, the owner wishing to try some experiments in the way of treatment, and having given assurance that he should in the meanwhile be placed where he could not endanger other animals.

In eight of the cases, glanders alone was developed; in four, farcy alone; and in nine glanders and farcy existed together. Nine were owned in the city, one in East Providence; one in Pawtucket; one in Centredale; one in Cumberland; one in Burrillville; two in Coventry; five were found on the Cove lands, brought there by the horse traders; two of them from Johnston; one from Cranston; one from Voluntown, Conn.; one from Massachusetts.

Some were in good condition, well used and well cared for; but a majority were old, ill-fed, over-worked and sadly neglected.

How the disease became so prevalent, may be explained, in part, by the following facts: The first four cases were taken from the dealers in old horses; where they came from, or when they came into the State, could not be ascertained; but as they were moved about from place to place, and sold from one dealer to another daily, they no doubt did much to spread the contagion. In June, a circus, with a large number of horses and mules traveled through the different towns, and it was noticed while they were in the city, that many of the animals were affected with something like glanders. It no doubt was glanders, as a few days after it was discovered that the company sold a pair of mules when at Phenix that had the disease in its last stages, and these must have helped to extend it. Thus glandered and farcied animals have been found worked and driven on the streets, spreading the poison by contact, leaving it at the public watering places, at the hitching and standing places, and wherever they went. In some instances there has been utter neglect to purify the stalls, stables, &c, from which diseased animals have been taken; and much evil has been done by men called "horse doctors," whose ignorance and presumption are only equalled by the confidence of those who employ them. We have found horses, some with glanders in a fearful form, under treatment for catarrh, and others, with swelled legs, discharging from farcy sores, treated for sprains, and in some instances, when the disease was known, it was under treatment by the "doctors," they claiming the ability to cure it, and doing nothing in the meantime to protect sound animals from danger.

The twenty-one cases we have recorded, are not, probably, a quarter of all that have occurred in the State during the year; but they are enough to excite alarm, for of all the diseases to which animals are liable, none is more terrible.

Glanders and farcy are one and the same disease—only different developments of the same specific poison. It is contagious and infectious. Horses and mules seem most obnoxious to it, but other animals and men, may take it by contact; and to all alike it is fatal. Within the last four years, three men in this city and one in Pawtucket, have died of it, the poison having been absorbed through cuts or sores on the hands.

It is difficult to distinguish glanders in its incipient stage from a simple catarrh, and farcy may be mistaken for an injury, or cutaneous affection, not of a dan-

gerous nature. For this reason, and now especially, when the disease is so prevalent, in every case at all resembling it, the best veterinary skill should be consulted. If there is any doubt of its character, the subject should be securely isolated, until it is decided; then, should it prove to be the disease, there is but one course to pursue, the animal should be killed at once and properly buried.

To aid in extirpating the disease, all who have the charge of animals should be induced, if possible, on the least suspicion of its appearance, to have it examined by some one or more competent persons, designated for that purpose, and then be governed by the advice given. If this examination could be had free of charge to the applicant, it would be more likely to be effectual. Much might be done, also, by a careful inspection of public, and in many instances, of private stables from time to time. Then it should be seen, that there is no failure to thoroughly cleanse and disinfect the places that have been occupied by such diseased animals, and all the objects used upon or around them.

We would suggest the importance of some provision being made for the removal and burial of glandered and farcied animals. There are those who are prepared to do it, but it cannot be expected that they will perform such disagreeable and dangerous business, without pay from some one, and the owners who suddenly find themselves deprived of their horses, for no fault of their own, it may be, are often to poor to meet the expense.

N. A. FISHER,

*General Agent R. I. Society for the Prevention of Cruelty to Animals.*

#### DISCOVERY AND DISPOSAL OF DISEASED HORSES.

During the eight months the Board has been performing the duties of the Cattle Commission, the Secretary has personally visited twenty-six horses suspected of having glanders, and by his order more than two hundred horses coming into the State in troupes, have been examined as a precaution against the introduction of the disease from without.

The number of cases of glanders or farcy that have died within the knowledge, or been killed by order of, the Board or its agents, since its organization is sixteen. Besides these, information of a reliable character, gives the number of eight more, that have been inspected, killed and buried at the expense of the owner.

Many of the cases of glanders are the property of poor men who would feel it too much of a hardship, and have too little sense of responsibility, to bury the animal in a proper place and manner. It has been found best for the interest of the public, to see that every glandered horse should be buried in such a manner as to prevent the further spread of the disease from that source. Arrangements were

therefore made with Mr. W. E. Barnes of Field's Point, who had acted in the same capacity before, to take away, and properly bury in a secluded spot, upon order of the Board or its agents, all the glandered horses found and condemned in the city of Providence, and surrounding towns; and keep a record of the same, the date of death, the color and probable age, name of owner or party in possession, and last place where kept.

Among those who have rendered valuable assistance to the Board and its agents, in determining positively the character of the maladies of the diseased animals, coming under their observation, mention should be particularly made of Drs. C. H. Peabody, and C. H. Scrutton, veterinary surgeons of the city of Providence, and also Mr. Charles H. Thurber of the same city, and local agent of the Society for the Prevention of Cruelty to Animals, who has had large experience among glandered and farcied horses.

The following report of Dr. N. A. Fisher, for the year ending January 1, 1879, will give a summary of the cases of glanders, that have come within his knowledge during the year, and also presents some valuable suggestions in regard to that insidious and incurable disease:

R. I. SOCIETY FOR THE PREVENTION OF CRUELTY TO ANIMALS, }  
PROVIDENCE, January 1, 1879. }

CHARLES H. FISHER, M. D., *Secretary of the State Board of Health:*

SIR:—In compliance with your request the agents of the Rhode Island Society for the Prevention of Cruelty to Animals, have continued to investigate, to dispose of as directed, and to keep a record of all cases of glanders and farcy that have come to their knowledge since the organization of the State Board of Health, as they did previously at the request of Dr. Snow, Chairman of the Cattle Commission, and the following report is submitted for the year ending January 1, 1879:

The number of cases of glanders and farcy that have been investigated or that have come to the personal notice of the agents of the Society for the Prevention of Cruelty to Animals, during the year is twenty-five; of which three died of the disease, and twenty-two were killed. Besides these, we have had reports from reliable persons of eighteen others; making altogether forty-three cases. All were horses.

Ten of these were found in one stable, four in another, three in another, and two each in two others. Eighteen belonged in the city; one in East Providence; one in Warren; two in Pawtucket; one in Cumberland; two in Smithfield; twelve in Crauston; one in Johnston; one in East Greenwich; two in West Greenwich; one in Coventry, and one in Burrillville. This last was brought from Massachusetts to Burrillville and died a few days after. These, we believe, are about all that have occurred in the State.

From these statements it appears that while the disease has been spread over about the same territory, the number of cases has greatly decreased, there having been but forty-three cases this year to one hundred and ten the year previous. This decrease is owing in a large degree, probably, to a better knowledge on the part of those who have the care of horses, of the early symptoms of the disease, and of the importance of a prompt resort to the only means of controlling it; which are—the immediate destruction of the subject, when the evidence of the disease is conclusive, and the careful isolation of all doubtful or suspicious cases. Also to a better observance of general sanitary and suppression measures, such as ventilation, protection from the severities of the weather by proper shelter, blanketing, etc., and the more thorough cleansing and disinfection of stables and stable utensils where the disease has existed.

Undoubtedly more might have been done to lessen the disease had provision been made for a proper inspection of all stables and localities where it made its appearance. The necessity for this does not seem to be appreciated. Fleming, the best authority on this subject, says: "Horses which have been in contact with others suffering from glanders or farcy, or which are suspected in consequence of cohabitation with them, if they do not exhibit any symptoms of the disease, should remain under veterinary surveillance for a certain period, which must not be less than twenty days, and may even be extended to six months. During the shorter period they ought to be frequently inspected—at least once a week. For the twenty days they should not be allowed to mix with other horses; but if after that time, they remain in good health, they may be used in the locality until all apprehension of danger has passed away."

The removal of animals isolated or suspected, should not be permitted without the knowledge and consent of the inspector; nor should any sale of such animals be made without the knowledge on the part of the purchaser that they are under surveillance for glanders or farcy.

We would call your attention to the importance of having early reports of all cases of glanders and farcy. And for this purpose—since it cannot be expected that parties will voluntarily give information which they think may prove injurious to their own interests—to the necessity of such legislation as shall make it the duty, under penalty, of all veterinary practitioners and of all owners and persons having custody of animals, to report promptly all cases of the disease which come to their knowledge, which reports, when it is possible, shall give the name of the owner or person in charge, the time when, and place where found, and how disposed of, together with a description of color, age and condition, and whatever can be learned of its history that may aid in its extirpation.

The burial of glandered and farcied horses found in and near the city, has been done by Mr. Barnes at Field's Point, after the manner prescribed by Dr. Snow, and approved by your Board.

Whenever there has been any question on the part of the owner as to the character of the disease, we have consulted with Drs. Scrutton and Peabody, veterinary surgeons. We have also, in such cases, made examinations post-mortem; and these, in no instance, have failed to satisfy the doubts of all.

N. A. FISHER,

*General Agent, R. I. Society for the Prevention of Cruelty to Animals.*

## CONTAGIOUS DISEASES OF OTHER ANIMALS.

In the foregoing report of the work on the Cattle Commission, reference has been made exclusively to diseases among horses. In regard to the presence of any contagious disease of a serious character among other animals, the Commission have no knowledge of any out break in any part of the State. A few cases of supposed pleuro-pneumonia have been reported, all in single cases and different localities. Texas cattle are still driven through Kansas and into the western States, contrary to law, and diseased animals are frequently found as far east as Albany, but the stringent restrictions put upon the introduction of beef, and other cattle into the States of Massachusetts and Rhode Island, have for some time been so much of a terror, to drovers and cattle merchants, as to arrest the forwarding of diseased animals into either of these States. There have been some deaths among swine, which have excited temporary local alarm. Portions of diseased organs have been brought to the Secretary for inspection, but no evidence has been shown of contagious disease among them. It is believed the State is free from any contagious disease dangerous to life among animals, except that of glanders among horses.

## EXPENSES OF THE BOARD.

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Envelopes and letter paper.....	\$53 15
Printing circulars, postal cards, &c.....	16 14
Paper and printing 20,000 tracts.....	99 14
“ “ Blank returns of deaths.....	45 74
Stamps and postal cards.....	40 00
Expressage and distribution of documents.....	3 50
Blank books, desk materials, stationery, books, twine, wrapping, &c.....	42 06
Six Vols. Sanitarian.....	20 00
Fuel.....	5 50
Salary.....	830 75

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Board of Health proper.....\$1,155 98

*Cattle Commission.*

Advertising.....	\$77 56
Fifteen hundred posters, paper, cloth, and card board.....	36 86
Express and posting.....	10 00
Expenses, veterinary experts....	65 50

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Total of bills rendered and certified January 1, 1879.\$1,345 90

The above expenses are less, by one copying-press returned (\$5.75), and transient material on hand, as follows: postal cards and stamps, (\$6.40); five reams and two and one-half quires letter paper; one hundred and eighty envelopes, note size, three hundred and twenty large size, five hundred and fifty yellow note; one quire large wrapping paper; twine and desk material.

The articles furnished the office by order of the Governor, are desk and table accommodations, seating, floor-covering, curtains, and usual articles for sweeping and dusting, and for sink. These are all of the most substantial character, were purchased at greatly reduced prices, and would bring, at this date—after use about eight months—probably first cost. The rest of the furnishing is private property.

## BOOKS RECEIVED.

- 21 Vols. from Secretary of State, R. I. Registration Reports.  
 2 " " " " Copy of Gen. Statutes and Public Laws.  
 1 " " " " State Census, 1875.  
 3 Vols. Chicago Reports, Board of Health, 1870-1877.  
 5 " Michigan " State Board of Health, 1873-1876.  
 1 " " " Vital Statistics, 1872.  
 1 " Ohio " " " 1877.  
 1 " Colorado " State Board of Health, 1876.  
 1 " Reading, Pa., Report, Board of Health, 1877.  
 1 " Surgeon-Gen. U. S. Army, Circ. No. 8, Hygiene, U. S. Army.  
 1 " " " " No. 10, Plans for Hospitals.  
 1 " Massachusetts Report, State Board of Health for 1878.  
 2 " " " " " " 1870, Reprint.  
 5 " New Haven, Conn., Reports, Board of Health, 1873-1878.  
 1 " Connecticut Report, Vital Statistics, 1877.  
 5 " New York City Report, Board of Health, 1868 to 1873.  
 1 " " " " Sanitary Code of Board of Health.  
 1 " New Jersey Report, State Board of Health, 1877.  
 1 " " Instructions in Regard to Registry Returns.  
 1 " " Hudson County Report, Board of Health.  
 1 " Virginia State Board of Health.  
 3 " Pennsylvania, Pittsburgh, Reports, Board of Health, 1875-'6-'7.  
 1 " U. S. Marine Hospital Service, Nomenclature of Disease.  
 1 " Wilmington, Del., Report of Water Engineer on Impurities.  
 1 " " " " Vital Statistics.  
 1 " Connecticut Registration Reports.  
 4 " Wisconsin, duplicate First and Second, Reports, State Board of Health.  
 5 " Sanitarian, Purchased Aug. 26.  
 1 " In Numbers for 1878.  
 1 " From Sec. State, Mass., Report of Sanitary Com., 1850.  
 1 " " " " Board of Health, Mass., Seven Years' Work.  
 1 " " Michigan, Report Sec. State Board of Health, 1877.  
 1 " " Dist. Columbia, Report Dist. Board of Health, 1877.  
 Various Blank Reports and Returns of Births, Marriages and Deaths.  
 1 Vol. by purchase.—Food: Its Value, &c. By H. Letheby, Ph. D.  
 1 " " Manual of Practical Hygiene. By E. A. Parker, M. D.  
 1 " " Handbook of Hygiene. By George Wilson, M. D.  
 1 " " Third Vol. American Public Health Association Reports.



## METRIC SYSTEM.

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As the *metric system* of weights and measures has intrinsic merit, and is rapidly being adopted by all scientific associations, leading practitioners of medicine and apothecaries, and by contributors to many of the public journals, it seems proper that its terms and equivalents should be brought constantly before the public eye.

The metric system was first suggested by French scientists about the year 1790, with a view of making all measures of length, volume and weight uniform throughout the world. It comprises the following units of measure:

The *meter*, the unit of length = the ten millionth part of the terrestrial meridian, or the distance between the pole and the equator = 39.370432 inches.

The *liter*, the unit of capacity = a cube of the tenth part of a meter = 1.0567454 wine quart.

The *gram*, the unit of weight = the weight of a cubic centimeter of water at its maximum density (4° Cent.) = 15.43234874 grains. In medicine, the *gram* is the unit of weight, and the *cubic centimeter*, or a measure of one gram of water, is the unit of volume; practically the two terms are equivalent, except with very heavy or very light liquids.

### EQUIVALENTS.

		<i>Grams.</i>		<i>Grams.</i>
One drachm (Troy) —	480 grains —	31.103	or about	32.
One scruple —	60 grains —	3.888	or about	4.
	1 grain —	.0648	or about	.06.
	$\frac{1}{2}$ grain —	.016	or about	.016.
	$\frac{1}{4}$ grain —	.008	or about	.008.

The average (household) teaspoon holds 5, and the large tablespoon 20 cubic centimeters.

## LENGTH.

1 Myrometer,	Mm.	(10,000 m.)	-- 6.2137 miles.
1 Kilometer,	Km.	(1,000 m.)	-- 0.62137 mlie.
1 Hectometer,	Hm.	(100 m.)	-- 328.0833 feet.
1 Decameter,	Dm.	(10 m.)	-- 39.37 inches.
1 Meter,	m.	(1 m.)	-- 39.37 inches.
1 Decimeter,	dm.	(0.1 m.)	-- 3.937 inches.
1 Centimeter,	cm.	(0.01 m.)	-- 0.3937 inch.
1 Millimeter,	mm.	(0.001 m.)	-- 0.03937 inch.

## SURFACE.

1 Hectare,	Ha.	(10,000 sq. m.)	-- 2.471 acres.
1 Are,	a.	(100 sq. m.)	-- 119.6 square yards.
1 Centare,	ca.	(1 sq. m.)	-- 1.550 square inches.

## CAPACITY.

1 Kiloliter or Stere,	Kl. or st.	(1,000 l.)	-- 1.308 cubic yards.	-- 264.17 gallons.
1 Hectoliter,	Hl.	(100 l.)	-- 2 bush. and 3.26 pecks.	-- 26.417 "
1 Decaliter,	Dl.	(10 l.)	-- 9.08 quarts.	-- 2.6417 "
1 Liter,	l.	(1 l.)	-- 0.908 quart.	-- 1.0567 qts. (1.761 imperial pints.)
1 Deciliter,	dl.	(0.1 l.)	-- 6.1022 cubic inches.	-- 0.845 gill.
1 Centiliter,	cl.	(0.01 l.)	-- 0.61022 cubic inch.	-- 0.338 fluid ounce.
1 Milliliter,	ml.	(0.001 l.)	-- 0.061 cubic inch.	-- 0.27 fluid drachm.

## WEIGHT.

1 Millier or Tonneau, M. or T.	(1,000 Kg.)	-- 1 Kl. or 1 Cu. m.	-- 2204.6 lbs. (avoirdupois.)
1 Quintal,	Q.	(100 Kg.)	-- 1 Hl. or 0.1 Cu. m.
1 Myriagram,	Mg.	(10 Kg.)	-- 1 Dl. or 10 Cu. dm.
1 Kilogram,	Kg.	(1,000 g.)	-- 1 l. or 1 Cu. dm.
1 Hectogram,	Hg.	(100 g.)	-- 1 dl. or 0.1 Cu. dm.
1 Decagram,	Dg.	(10 g.)	-- 1 cl. or 10 Cu. cm.
1 Gram,	g.	(1 g.)	-- 1 ml. or 1 Cu. cm.
1 Decigram,	dg.	(0.1 g.)	-- 0.1 ml. or 0.1 Cu. cm.
1 Centigram,	cg.	(0.01 g.)	-- 0.01 ml. or 10 Cu. mm.
1 Milligram,	mg.	(0.001 g.)	-- 0.001 ml. or 1 Cu. m.

One kilogram is equal to a weight represented by one liter of distilled water at 4° C. In the centigrade scale 0 (32° + F.) is the freezing point; 100° + (212° + F.) is the boiling point. Five degrees C. corresponds to nine degrees F.

*All measures* in the metric system are derived from the meter, and their names express their values. Some of the names in the French system (like our "dime") are not in practical use; e. g., hectometer, decagram, etc.

One inch = 2.5 centimeters nearly; one quart (wine measure) = 0.946 liter; one pound troy = 0.373 kilogram; one acre = 0.4046 hectare.



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# Treatment of the Drowned.

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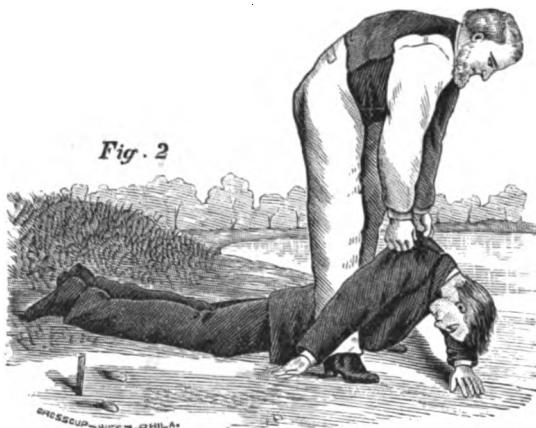
The following methods and rules were devised and prepared by a committee of the Michigan State Board of Health, and are a modification of those previously prepared by Dr. Beech of Coldwater, Mich., and of those published by the Life Saving Society of New York. They have the sanction of other State Boards of Health and of City Boards of Health, and are fully indorsed by the State Board of Health of Rhode Island.

## THE TREATMENT OF THE DROWNED.

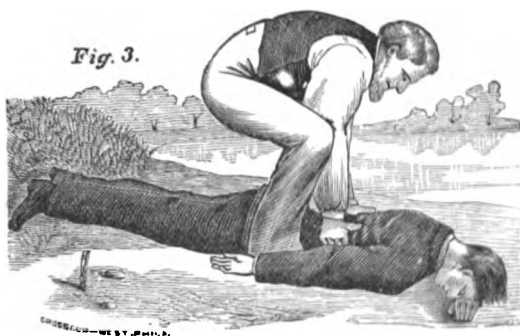


**TWO THINGS TO BE DONE:—RESTORE BREATHING; RESTORE ANIMAL HEAT.**

**RULE 1.**—*Remove all obstructions to breathing.* INSTANTLY loosen or cut apart all neck and waist bands; turn the patient on his face, with his head down hill; stand astride the hips with your face toward his head, and, locking your fingers together under his belly, raise the body as high as you can without lifting the forehead off the ground (Fig. 1), and give the body a smart jerk to remove mucus from the throat and water from the windpipe; hold the body suspended long enough to slowly count ONE, TWO, THREE, FOUR, FIVE,—repeating the jerk more gently two or three times.



**RULE 2.**—Place the patient face downward, and maintaining all the while your position astride the body, grasp the points of the shoulders by the clothing, or, if the body is naked, thrust your fingers into the armpits, clasping your thumbs over the points of the shoulders, and *raise the chest as high as you can* (Fig. 2) without lifting the head quite off the ground, and hold it long enough to *slowly* count ONE, TWO, THREE. Replace him on the ground, with his forehead on his flexed arm, the neck straightened out and the mouth and nose free. Place your elbows against your knees, and your hands upon the sides of his chest (Fig. 3) *over the lower ribs, and press downward and inward with increasing force* long enough to slowly count ONE, TWO. Then suddenly let go, grasp the shoulders as before and raise the chest (Fig. 2); then press upon the ribs, &c. (Fig. 3). These alternate movements should be repeated 10 to 15 times a minute for an hour at least, unless breathing is restored sooner. Use the same regularity as in natural breathing.



**RULE 3.**—After breathing has commenced, **RESTORE THE ANIMAL HEAT.** Wrap him in warm blankets, apply bottles of hot water, hot bricks, or anything to restore heat. *Warm the head nearly as fast as the body, lest convulsions come on.* Rubbing the body with warm cloths or the hand, and slapping the fleshy parts may assist to restore warmth and the breathing also. If the patient can **SURELY** swallow, give hot coffee, tea, milk, or a little hot sling. Give spirits sparingly, lest they produce depression. Place the patient in a warm bed, and give him plenty of fresh air; keep him quiet.

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### BEWARE!

**AVOID DELAY.** A **MOMENT** may turn the scale for life or death. Dry ground, shelter, warmth, stimulants, etc., at this moment are nothing,—**ARTIFICIAL BREATHING IS EVERYTHING**,—is the **ONE REMEDY**,—all others are secondary.



## BE PROMPT.

*Do not stop to remove wet clothing before efforts are made to restore breathing.* Precious time is wasted, and the patient may be fatally chilled by exposure of the naked body, even in summer. Give all your attention and effort to restore breathing by forcing air into, and out of, the lungs. If the breathing has just ceased, a smart slap on the face or a vigorous twist of the hair will sometimes start it again, and may be tried incidentally, as may, also, pressing the finger upon the root of the tongue.

Before natural breathing is fully restored, do not let the patient lie on his back unless some person holds the tongue forward. The tongue by falling back may close the windpipe and cause fatal choking.

If several persons are present, one may hold the head steady, keeping the neck nearly straight; others may remove wet clothing replacing at once clothing which is dry and warm; they may also chafe the limbs, and thus promote the circulation.

*Prevent friends from crowding around the patient and excluding fresh air ;* also from trying to give stimulants before the patient can swallow. The first causes suffocation; the second fatal choking.

**DO NOT GIVE UP TOO SOON:** You are working for life. Any time within two hours you may be on the very threshold of success without there being any sign of it.

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*In suffocation by smoke or any poisonous gas,* as also by hanging, proceed the same as for drowning, omitting effort to expel water, etc., from windpipe.

*In suspended breathing from effects of chloroform, hydrate of chloride, etc.,* proceed by Rule 2, taking especial pains to keep the head very low, and preventing closure of the windpipe by the tongue falling back. Grasp the tongue between the forefinger and thumb, draw forward and hold.

## PERSISTENCE IN EFFORTS TO RESCUSITATE THE DROWNED.

Dr. R. C. Kedzie, President of the Michigan State Board of Health, says, in relation to the foregoing circular, and in urgent persistence of efforts to resuscitate the drowned: "This bulletin has been widely distributed by this Board and it has been republished by many papers in our State. It has been adopted by other State Boards of Health and by city Boards of Health. It has thus secured a wide dissemination in our country. How much good has thereby been secured, it is impossible for me to state; but I have good reason to fear that *life is often sacrificed because energetic efforts at resuscitation are abandoned too soon*. I desire once more to urge upon the public *the duty of persistent efforts to resuscitate the drowned* and to repeat with emphasis one direction of the bulletin: 'DO NOT GIVE UP TOO SOON; *you are working for life. Any time within two hours you may be on the very threshold of success without there being any sign of it.*'"

"The efforts which are successful in restoring a human being to life certainly are not useless, and it is wicked to refuse or neglect to make such efforts unless the absolute certainty of death is established. It is not enough to say that the person *appears* to be dead. Persons who gave no signs of life for a long time after being taken out of the water have yet been brought to life by appropriate efforts. I most earnestly protest against treating the drowned as dead merely because they appear lifeless. I am fully persuaded that many such persons die because no adequate efforts are made for their recovery. Persons may swoon and for the time appear to be dead, but we do not assume that they are dead and leave them to their fate, but make energetic efforts to restore consciousness. No more should we assume the fact of death in the drowned, but should make like efforts to restore them to life."

## HOW NOT TO DROWN.

"How to drown is an art that seems to be well understood and frequently practiced the world over. How not to drown is an art not so well understood, and requires some notice at the hands of this Board.

Drowning could be prevented if we could secure either of the following conditions: 1st, that everybody should know how to swim; 2d,

that nobody should ever go into the water. But as we cannot secure either of these conditions in the present order of things, we turn our attention to some means of reducing these accidents to their minimum of danger.

“Much good advice is often thrown away upon persons who find themselves suddenly thrown into the water: “keep cool;” “do not lose your presence of mind,” etc. The conditions are very favorable to follow the first advice in a literal sense, for the water itself will assist one to get cool and to keep so indefinitely; but when a person is suddenly compelled to face death in an unexpected form, the advice to “preserve your presence of mind” is usually driven out of the mind by overwhelming terror, and the person too often becomes *absent minded* in an awfully literal sense of the word.”

“The solids and liquids of the body are all heavier than water, but the living body on account of the air in lungs, stomach, and bowels, is slightly lighter than water; and so long as these cavities remain filled with air, the body will float in water, and a small part of the body can be kept above the water. While it is true that so long as the lungs, etc., are filled with air, the body is lighter than water, the difference in specific gravity is small, and only a small part of the body will float above water. What part will be above water depends upon the relative position of other parts of the body; if the legs are flexed and the arms thrown in front of the body, the centre of gravity is in the anterior portion of the body, and the top of the shoulders and back of the head only will be above water; the face being under the water, respiration will be impossible under such circumstances. But if the legs are straightened out and the arms thrown behind the body, the face will be brought above the water. In the attempt to float, therefore, *the legs should be straightened out, the head thrown back, and the arms held behind the body*; the face will then float above the water so long as this position is maintained. If one part of the body is thrown out of the water, a corresponding amount of the body will be submerged; if the arms are held out of the water, the head will go under. I remember the case of a boy who thought he would greatly increase his power to swim by tying an inflated bladder to each foot, but when he entered the water he came near drowning, because his feet were kept out of the water but his head under water; and he soon became practically convinced that it was important that his head rather than his heels should be in air.”

“If the mouth and nose is kept above water, respiration may go on without interruption, and life may be sustained indefinitely under such

circumstances. This may be secured in still water by merely floating with the face upward, every other part of the body being kept constantly under water. But with very little exertion a person may do more than keep his nose above water, even if he is ignorant of the art of swimming. I have seen persons "tread water" by making the same movements with the legs as in walking up stairs, and thus keep the entire head out of water for a long time. If a person will add to this, certain corresponding movements of the hands—in fact, *make the same movements of both arms and legs that he would in climbing a vertical ladder*, but without lifting his arms out of the water and without closing his hands in the downward movement of the arm, he may keep his head out of the water even when the waves are running high, and may keep from drowning for hours. Whenever a person finds himself in the water and in danger of drowning, let him assume as speedily as possible a vertical position, and at once begin the same movements as in climbing a vertical ladder—*let him climb for life*—and he will be surprised to find with what slight exertion he can keep his head above water; let him be satisfied with this, for he may exhaust himself in vainly attempting more."

The following communication by Dr. MacCormac of Belfast, to the Sanitary Board July 13, 1877, on "PADDLING THE WATER AS A MEANS OF AVERTING DROWNING," is inserted as imparting valuable information on this important subject:

"Already the fine season has been ushered in by a number of deaths, some of them occurring in our very midst, from drowning. The means of safety, or relative safety, which I have to point out, are so very simple, and as I believe, so effective, that I am lost in wonder that no one has thought proper to insist upon them, as in the following remarks it is my intention to do. 'Swimming, as ordinarily practiced, is not the most sufficing means for escaping the dangers of the water. It needs some instruction to be able to swim, and practice to be able to swim well. No doubt it is desirable to swim and to swim well. But the great majority of persons of both sexes do not know how to swim at all. Yet unless people can swim, and swim well,—and even then they are not always successful, when the emergency comes, in preserving life,—swimming is, I am persuaded, not so effective a preservative as is conjoint paddling and treading water. As a rule, subject to few exceptions, persons precipitated into the water do not swim without previously learning. But paddling with the hands and treading with the feet require no prior instruction, and in the great

majority of cases would save life. In swimming, the mouth is on a level with the water in the intervals of the strokes; in paddling, the head is well elevated; the individual is able to look about; he can deliberate as to what is best to be done, and he is much less liable to take water into the larynx or glottis, a casualty which, I am persuaded, causes the destruction of many. Without prejudice to the art of swimming, I would have children exercise in household tanks from the tenderest age, in the act of paddling and treading water, so as to impart the confidence which unreasoning dread tends to lessen or take away when one is suddenly immersed, in an unusual medium. The animal, the quadruped, begins to paddle at once when cast into water, but as man does not habitually employ the anterior limbs as organs of locomotion, reason must tell him that he may, if he pleases, employ them as organs of locomotion in the water, just as readily as any four-footed animal. To be sure a man has not the habit of using his hands and arms for locomotion, as the brute has, but otherwise how much more available is the paddle-shaped hand than a hoof or a paw. Again, the man with little or no instruction, by throwing his head well back, can float and rest at pleasure, a thing of which the brute has no conception whatever."

"Of course, a little preliminary habitude is desirable, but without any preliminary habitude or instruction whatever, there is nothing to hinder man, woman, and child, were they unable, in common parlance, to swim a stroke, from beating water with the hands and feet, just as the lower animals do, and so keep themselves afloat for a protracted period, a period that in a multitude of instances would be found sufficient to invite rescue and preserve life. The action of the feet down will sustain the body. The action of the hands down will do so; *à fortiori*, the action of both will prove yet more effective. I have tried myself; one alone, or both together,—nay, with a single hand only,—in bygone years, I am sure, hundreds of times. There is no occasion for fuss or bustle. The body, taken as a whole, is actually lighter than water, bulk for bulk, and a very moderate amount of paddling with feet and hands, will be found perfectly adequate to sustain and guide its movements. In fact, so long as the individual paddles, as I here direct, he cannot sink. A horse, or dog, or cow, or cat, or swine, when immersed in water, begin instantly to paddle, and that without any prior instruction or exercise whatever. Now, a man, or woman, or child has only to do as the inferior animal does, and he, she, or it will float necessarily and inevitably. The place being otherwise safe and boats at hand, boats' and ships' crews, a regiment of

soldiers, schools and the like might jump into deep water and paddle themselves into security without risk or failure. In this, as in many other things, man is too often unaware of his own immense capacities."

"Animals not habituated to the water, will often take to it spontaneously, or, if cast into it, sustain themselves for indefinite periods. A horse, during disembarkation in Portugal, fell into the sea and paddled about the harbor for a matter of six hours before it was secured. Washed or thrown overboard, the lower animals have been known to float for a long time. I knew of a mule, which, having been washed overboard in the Bay of Biscay, paddled itself ashore, and then crossed the country a couple of hundred miles to its previous quarters. The staff-surgeon in charge told me that, after leaving the Peninsula, the horses of the troop had to be thrown overboard in order to lighten the ship in a gale. The poor things, when they found themselves abandoned, faced around, and, so long as the ship commanded a view, were seen to battle with the wrack and wash for miles. A man on the coast of Lincolnshire, mounted on a gray mare or other horse, used to swim seaward to vessels in distress, and thus rescued many lives. Recently, nigh Brooklyn, N. Y., a dog took the water and paddled, it is said, forty miles in search of his master. Dogs often gain the shore when ships and their crews have been lost. Some years ago a dog landed at the Cape of Good Hope, with a letter in his mouth. The vessel to which he belonged had gone down with all hands; but if the men had paddled as the dog paddled, all their lives might have been preserved. Indeed, I know for certain that formerly it was the practice at the Cape for men to paddle out, it was termed "treading water," and bear communications to and from vessels in the offing, where no boat could live. It was, and I believe is still, the case at Madras, similarly. Natives at the island of Ioanna, in the Mozambique Channel, treading water, come out, bearing fruit on their heads to the vessels, miles distant. The young people in the islands of the Pacific, breast the gigantic breakers out of mere sport. The Indians of the Upper Missouri traverse the impetuous current, invariably paddling and treading water."

"Short instructions for paddling and treading water, ought to be posted up in all schools, barracks, and bathing places; wherever, in short, people have to do with the sea or with masses of water. It should be shown how easy it is, with a little well-directed effort, to preserve life, and how the yearly and calamitous destruction which befalls our shores might, now, and happily for all time to come, be effectively stayed."

One precaution is necessary for a person who is paddling and treading water, to avoid strangling; when cold water is suddenly dashed into the face, an automatic or involuntary inspiratory effort or "catching the breath" is caused, and if the face at the instant is covered with water, strangulation from drawing water into the lungs is the result. When waves are dashing in his face, the person must guard himself against this spasmodic inspiration by holding his breath at such times, or he may even grasp his nose and close his mouth with one hand and thus prevent the possibility of strangulation.

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# HYGIENE IN THE PUBLIC SCHOOLS.

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BY

GEORGE W. JENCKES, M. D.,

OF WOONSOCKET,

MEMBER OF THE

STATE BOARD OF HEALTH.

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The following paper is a part of an Address by Dr. G. W. Jenckes  
at the dedication of the Woonsocket High School.

## HYGIENE IN THE PUBLIC SCHOOLS.

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We ought to realize that true education does not consist merely in the acquisition of knowledge, the crowding of the memory with facts, but in developing all the powers of body and mind equally and harmoniously, and strengthening them by vigorous exercise. In pleading for the best education possible for us to obtain through the means at our command, and in protesting that the sharpening of the mental perceptions is but a small part of such education, what I shall say may possibly "smack somewhat of the shop."

It is not beyond the province of one who has given some attention to the study of individual and public health, to question somewhat the routine of school life and education. It is too much the fashion to lay great stress upon the mere intellectual processes involved in the pursuit of a well arranged course of study, which, as a means of mental discipline, may be all well enough, but which fails to be of practical benefit in the after affairs of life in a large proportion of scholars. We establish a curriculum of studies that shall fit for some special vocation in life; we teach something of the customs of communities and the regulations that prevail in business, but we do far too little toward imparting a true knowledge of physical existence. Physical education should go hand in hand with mental education. Health is a part of the higher culture, for body and mind are practically inseparable, and we should know nothing of the workings of the sound mind, were not the bodily senses in healthy condition to provide for the mental needs.

Health stands behind the accomplishment of all great success. It was not an army of invalids that marched with Sherman to the Sea, and broke the back of the rebellion with the force of a mighty blow.

The vigor and hardihood of able bodied soldiers and the supreme energy of an educated will in the commander, were equal, if not superior, agents to the musket and cannon in securing that triumph.

And so it is in every sphere of life. The application of practical force alone can make actual accomplishments of what would otherwise remain the dreams or hopes of a weaker will. Our education tends too much to create wants and expectations beyond our power to realize. Let me quote one who has spoken thoughtfully upon this subject: "Our young men know how to spend more money than they can earn, and our young women too often feed their ambition upon romantic fancies, and fill their stomachs with enfeebling trash! They dream of fortunes and palaces, and do not know how to make a shirt or a loaf of bread, to nurse an invalid or tend a baby, to train a child or rule a household; and sometimes even they crave the jewels and orange blossoms of the bride, while they repudiate the duties of the wife and the destinies of the mother. And the race is in danger of dying out in some quarters because of this repudiation of the queenly dignity and fidelity of the sex." What we need, then, is a careful and systematic education of all the powers of the body and mind, so that while the mental perceptions are sharpened, and the moral attributes cultivated, the physical system shall be placed and kept in such relations to external influences as shall establish the best possible degree of health. There is much wisdom in the old nursery rhyme,

"Early to bed and early to rise,  
Makes a man healthy, wealthy and wise,"

in that it gives health the precedence, leaving wealth and wisdom to follow if they may. The saying that "wisdom and virtue cease where dyspepsia begins," is but an extravagant expression of the same truth. The primary fact to be recognized is, that all our education comes through the senses, and the more healthily and wisely they are open to the truths and forces of the universe, the more active and the stronger will be the mental operations resulting. Health begets force, and force applied to knowledge, makes it a power. It is said that "Cæsar was a better speaker and writer because he had been a soldier, and could put into his pen, in his commentaries, the point and fire he had won by his sword in his campaigns; and that David was a greater poet because the hand that touched the lyre, had grappled with the lion and the bear, and had hit the Philistine upon the head with a sling, as unerring as the words that have reached the heart of the race, and will reach it evermore." Our very constitution as organic bodies,

determines our duty; all the health and strength of which we are capable are demanded by our possible attainments. Not only to establish this state of health, but to preserve it, is the part of Hygienic study.

Between a state of perfect health and actual disease, when professional aid is sought, there is a wide field, occupied by thousands who generate just enough of vital energy to enable them to maintain a sort of passable existence, but not enough to enable them to mingle in the harder conflicts of life. To remedy this state of things, more of our thought and effort as public educators ought to be directed. According to the reports of many of our Educational Boards, it is the nervous system especially which suffers from our present methods of education. To say nothing of special diseases, such as myopia, chorea, &c., which are on the increase among school children, we have all of us seen something of the pernicious effects of this intellectual high pressure in some of the recent sad instances of cerebral disturbance in public life. Without doubt, a proper amount and well regulated course of study are among the best means of strengthening both mental and bodily powers; and equally, without doubt, much of our present method of education by the amount and kind of work done, by illy selected hours of study, by improperly divided seasons of school work, where a short vacation follows each of two or three terms, and then a long vacation of two or three months of aimless idleness of body and mind, and by other means, such as illy lighted, illy heated and illy ventilated school-rooms, bad seats and bad type in text-books, by useless drills and cramming for special examinations, by rank lists, and by so much routine teaching from text-books rather than the cultivation of the original powers of observation in the pupil, result in an indescribable sense of fatigue at the end of the day's work, and prove the severest possible strain upon the child's natural powers. I speak of these things, Mr. Superintendent and friends, because I wish to urge that the study of Hygiene, practically the most useful science, should be made a marked feature in every grade of education. While the rudimentary truths should be inculcated in every household, the grand principles of the science should be thoroughly taught in every school, from the highest, where the teachers are fitted for their labors, to the lowest, where, either through errors of judgment or an almost unparadonable degree of ignorance, the first steps are taken in devitalizing so much child-force. For instance, how much time have we all seen devoted by teachers in trying to prevent certain motions and changes of position, that had become actual physiological necessities by reason of too long restraint.

Other misconceptions which I cannot particularize, as to the needs, habits and peculiarities of scholars, extend through the whole course. I can only say that if there were a better knowledge of Hygiene, there would be less negligence in the supervision of those conditions necessary to a continuance of intellectual as well as moral virtue in school children, and less ignorance on the part of parents and teachers of the existence of that nameless vice which saps the very foundations of nervous energy.

Properly taught, the study of Hygiene, involving as it does elementary instruction in chemistry and physics, as well as physiology, affords as good means of mental discipline as any other course of academic study, since its principles are the purely logical deductions of demonstrable facts. And beside the discipline thus afforded, the study of this science would have the further advantage of offering practical benefits to every member of the community. The amount and frequency of habitual crime are largely traceable to physical debasement. A knowledge, then, of the philosophy of health and life, would constitute one of the best legacies to posterity by informing those who are to give birth to future generations how best to fulfill their parental obligations, and to transmit to their offspring an unimpaired inheritance of health.

Mr. Superintendent, in committing to your special care the interests of education that shall centre in this building, I would express the hope that the instruction to be here imparted, shall result in giving to this community and State, able-bodied and able-minded citizens. Success in life, whether with the student, the artisan or laborer, can be achieved only by hard work, and hard work pre-supposes vigor of body, power of endurance and an educated will. These are the foundation stones; "other foundation can no man lay than that is laid."

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# WALL PAPERS,

THE DANGER TO HEALTH ARISING THEREFROM, AND  
HOW PREVENTED.

POISONOUS CARDS, LABELS, ETC.

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BY

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# WALL PAPERS,

THE DANGER TO HEALTH ARISING THEREFROM, AND HOW PREVENTED.

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## POISONOUS CARDS, LABELS, ETC.

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Some few years since the discovery was made that arsenic existed to a considerable extent in various wall papers offered for sale throughout the country, and many diseases whose origin had seemed mysterious were readily accounted for when the presence of this active poison became known.

For a while the public were cautious in buying, and green papers were a drug in the market.

The subject, however, soon lost its hold upon public attention, and finally disappeared out of sight and out of mind.

Arsenic, however, was still employed in the manufacture of wall papers, entering more or less into those of other colors and tints than the well-known green. Indeed, it is still an open question whether this well-known green, the very color of which admitted its baseness, was not less hurtful than is the modern fashionable wall papers in whose delicate tint and subdued tone may lurk this deadly poison all the more dangerous to life and health, because unsuspected or undiscovered.

All wall papers are not dangerous from this source, and there are undoubtedly green papers in whose pigment no poison is combined, but if one "must" purchase green wall paper let him first cause them to be tested for arsenic before exposing his household to possible sickness and death.



Although arsenic is the most dangerous element to be looked for in wall papers, it is by no means the only source of probable injury to health.

Every one is fully aware how easily the colors are rubbed off from the surface of many papers; how oftentimes the heaviest, thickest papers wear the shortest time, and how frequently the ordinary dusting of the room detaches the coloring material from the walls.

If this coloring matter thus detached was promptly removed from the room no injury would result save that to the appearance of the walls from constant loss, or apparent fading of the colors of the paper. But this coloring matter remains frequently as an impalpable dust in the room, to be breathed by those in the apartment, settling upon the furniture, hangings and carpet, and disturbed and put in motion, but *not* removed, whenever the room is dusted or swept.

Another source of possible injury to health exists in the decomposition of the sizing and paste used in, and upon, the paper hangings themselves. If arsenic should be present in the paper, it is a grave question whether this decomposition is not rendered exceedingly dangerous to health by the chemical combination thus formed, by the decomposition of the starch and gums with the arsenic, or even with other substances entering into the coloring matter upon the paper.

It is certainly worthy of passing consideration that in all papered rooms, a constant decomposition of the starch and gums is taking place, and persons occupying such rooms are living in an atmosphere more or less contaminated by the decomposition continually going on.

In proportion as houses are kept closed and darkened, does the danger from this cause increase, and the musty odor of a papered room which has been closed and kept darkened for some time, is sufficient evidence of the danger to be apprehended.

Three sources of danger to health, therefore, may be looked for in wall papers.

- I. From those known to contain arsenic.
- II. From those whose coloring matter is easily detached.
- III. From the decomposition of the size and paste employed in the manufacture of the paper, and hanging the same upon the walls.

The danger from these sources may be averted,—

- I. By submitting all doubtful or suspected papers to the tests for arsenic, before putting the same upon the walls.

II. By selecting such papers as are known to contain no arsenic, and where colors are not easily removed either by rubbing with a dry cloth or the hand itself.

III. By removing all the old paper, and thoroughly washing off with hot water, all the paste from the walls before repapering.

The simplest test for arsenic, and one most available for the public is given by R. C. Kedzie, M. D., Chairman of Poisons, &c., Michigan State Board of Health, 1873, and is as follows:

“If the color is a bright grass green it may be safely rejected at once. If a little ammonia poured upon the paper discharges the green color, or produces such a change in the color as indicates the removal of green it should be rejected.

“The two arsenical greens, Scheeles Green and Schweinpath Green, are readily soluble in ammonia water—the water acquiring a bluish tint. Other compounds of copper are also soluble in ammonia water, but they are not much used in paper hangings. If you wish to identify the arsenic, drench a piece of the paper in a little ammonia water, pour off the clear water and drop into this a crystal of nitrate of silver, if a yellow precipitate forms around the crystal it indicates arsenic.”

#### POISONOUS CARDS, LABELS, TAGS, ETC.

There exists at the present time another prolific source of danger from arsenic, particularly to young children. And that source is found in the “green” business or advertising cards, distributed indiscriminately upon the streets; in the green tickets used for entertainments, theatre checks, &c., and in labels, tags and shop cards. In fact the danger of poisoning from these cannot be estimated.

Every child should be prohibited from having any “green” card or ticket in its possession, and it should be the duty of every parent to impress upon his or her child or children, the dangers likely to arise from handling such cards, &c., especially when, as is often the case, the child’s hand is moist, and the poison is thereby easily detached from the surface of the pasteboard and communicated to the person handling it. An advertising card was recently shown the writer, probably one of thousands printed, and given away daily upon the streets, whose very color proclaimed its dangerous character, and the children of the family were forbidden ever to keep such a card, or ever to receive it from any one upon the street.

The estimable report of Dr. Draper, "On the evil effects of the use of arsenic in certain green colors," in the third annual report of the Massachusetts State Board of Health, and the article on "Poisonous Paper," by Dr. Kedzie, Michigan State Board of Health, for 1873, will well repay a careful reading by every one interested in the promotion of the public health.

It is impossible, in the short space of an article like the preceding one, to impress upon the general public the importance of the subject matter contained therein.

It is, however, to be hoped that such attention may be given to it, that the evils arising from ignorance of the matter may not be realized in this State, as they have been in numerous instances, not only in this country but in the countries of the Old World.

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THE PREVENTION OF  
KEROSENE ACCIDENTS.

BY

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OF PROVIDENCE.

PROFESSOR OF CHEMISTRY IN BROWN UNIVERSITY.

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## THE PREVENTION OF KEROSENE ACCIDENTS.

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Every one knows that kerosene accidents are constantly occurring. Yet I should think that the oil had been used long enough and widely enough for people to have learned how to use it with safety.

I do not think it worth while to explain here the scientific conditions which precede kerosene accidents; I do not think it desirable to discuss here the question whether such accidents are generally due to a mere *blazing up of a quantity of oil, carelessly spilled and set on fire*, or whether they are often caused (as is commonly believed) by *explosions of lamps*. A discussion of these or of other similar questions would probably prove of little service to those who are most likely to become the suffering and dying victims of bad or of misused oil.

I prefer that my remarks shall take the form of an easily understood warning; for I believe that such a warning is most likely to conduce to the protection of consumers of oil.

Now there are three principal conditions attending the use of kerosene oil: these conditions are *first*, the purposes for which the oil is used, *second*, the kind or quality of oil used, *third*, the character of the people using the oil.

FIRST CONDITION.—Kerosene oil is used in two well-known ways, namely: *for a wrong use*, as for kindling fires; *for a right use*, in lamps for lighting.

SECOND CONDITION.—Kerosene oil as offered for sale, is of two kinds, namely: *unsafe* oil, and *safe* oil.

THIRD CONDITION.—Kerosene oil is used by two classes of persons, namely: the careless and ignorant, and the careful and intelligent.

The mere statement of these conditions at once suggests three rules.

### FIRST RULE.

No person ought to use any kind of kerosene oil, good or bad, for kindling fires. When so used, the oil is liable to instantly burst into an enormous blaze which, streaming out of the stove, at once envelops any one near it in a sheet of flame that may cost the user his life.

### SECOND RULE.

No person ought to use unsafe oil. Every careful person will at once admit the force of this proposition. The question naturally arises, "how may we avoid unsafe oil?" I believe that the simplest answer is, "buy only from the most respectable dealers, and take from them only the oil of well-known respectable manufacturers."

It is true that our statutes make provisions looking toward the *complete exclusion of unsafe oils from the State*. But statutes may fail to produce their intended effects. Inspectors may not do their duty. Bad oil may be offered for sale. But there are several large firms engaged in making oil that is uniformly of high test, and safe.

Any honest and respectable dealer can at once mention the names of manufacturers whose oils are unquestionably safe.

### THIRD RULE.

Ignorant and careless persons ought not to be allowed to use kerosene oil at all. They should be required by their employers to use candles, or other extremely safe light.

These rules have so narrowed the subject that we may readily conclude that no anxiety need be felt when

- (first,) intelligent and careful persons,
- (secondly,) use safe oil,
- (thirdly,) in suitable lamps for illumination.

But the statement does not appear to be complete until we enumerate some of the marks which distinguish—in this matter—careful persons from careless ones.

## CARELESS PEOPLE.

Careless people neglect all day-work on the lamp; they leave it to be done at the worst time, that is, after night-fall.

If the careless person's lamp gets out of order or low in oil, he is tempted to keep it lighted while refilling—so he is liable to be burned to death in the operation.

## CAREFUL PEOPLE.

Careful people have more than one lamp; they buy oil in the day-time; they clean the lamps by day-light, filling them and trimming the wicks.

If one of the careful person's lamps gets out of order, *he uses the other*, and so he can fill, or otherwise adjust the other on the next day during the safer hours of day-light.

I leave these plain remarks to the common sense of the reader, feeling certain that, after all, it is common sense that must be the guide in this matter as in most of the business of life.





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# K E R O S E N E .

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BY

H. H. BURRINGTON,

OF PROVIDENCE,

CHEMIST AND DRUGGIST.

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## KEROSENE.

In compliance with the request of Hon. Elisha Dyer, Jr., Committee of the State Board of Health on *Explosives, &c.*, I respectfully present the following statement of facts in relation to kerosene; and the request comes in good time, as there are matters of importance in connection with the kerosene oil business in this city that need prompt and decisive action:

To make the matter as intelligible as the nature of the case will admit, I have thought it best to commence at the beginning.

As petroleum and its products have become of the greatest utility to the people of this, as well as of other countries, and as the whole business of its distillation, manufacture, &c., has become so systematized and perfected that there is no reason and no excuse why any kerosene oil, intended for illuminating purposes, should be allowed to be placed in the market, or permitted to be sold, that is not safe, or that will not stand a legal fire test, duly inspected, and the package in which it is contained suitably branded by a competent person appointed for that purpose. In the early days of its discovery, many accidents occurred from a want of knowledge of its properties, which might have been excusable, at that time, but are not so now.

The matter of unsafe kerosene oil, sold in this city for illuminating purposes, was first brought to the notice of the City Council, in April, 1866, and was published in the *Daily Journal*, at the time, as follows:

### A STARTLING FACT

was brought to the attention of the Common Council, at its last meeting, by Mr. H. H. Burrington, who introduced the draft of an

ordinance, relative to inflammable and explosive articles, and took occasion to comment upon the dangerous character of much of the kerosene now sold in our city, for illuminating purposes. Mr. Burrington has tested twenty-one samples, and finds much of it as unsafe as gunpowder. Only five of the samples were safe to use as a burning fluid, and they were not entirely free from objection.

In introducing his ordinance, Mr. Burrington remarked: The great consumption of kerosene oil in cities where gas, so called, is used, as well as in villages where gas is not used, loudly calls for a few remarks upon its properties, the benefits, and disadvantages, the safety, and danger attending its use.

In the manufacture of kerosene, the first running of the oil is called benzine, kerosoline, &c., &c. Now benzine has a peculiar property, in which we all are deeply interested: it is that of explosion, and it is the presence of this fluid in kerosene proper which renders the oil explosive. Exclude from the kerosene this explosive part of the fluid—this benzine—and we have an oil as harmless as that of the spermaceti whale, with a far greater illuminating power.

But it unfortunately happens that this explosive product—the benzine—is in large proportion to the whole distillation, and in consequence, a part of it is suffered to remain in, or is intentionally mixed with the kerosene. As is the proportion of benzine to the kerosene, so is the power and danger of the explosion. That some of the kerosene in the market is carefully and properly prepared, and therefore perfectly safe in its use, is abundantly and satisfactorily proved; while it is a fact lamentably ascertained by almost daily experience, that much of the kerosene sold among us, contains too large a proportion of the explosive material. Now, the first question that naturally arises is: how are we to know what oil is safe to burn, and what is not.

It is well known that heat increases the explosive powers of kerosene, by converting the benzine, or a portion of it, into vapor, which instantly ignites on coming in contact with a flame; hence the explosion of a kerosene lamp when it is extinguished by blowing down the glass chimney upon the flame. If too much benzine be present, a little heat is enough to raise sufficient vapor to be dangerous.

By decisive experiments, it is known that kerosene that will bear heat of 120° F. is safe. No danger attends it, if used in a properly constructed lamp, and the heat to which kerosene is exposed, in all ordinary occasions does not equal the temperature named. Kerosene that will not stand the test of 100° F. should be looked upon as so much gunpowder.

In consideration of the above facts, I have been induced to test the quality of twenty-one samples of kerosene now in market, with a kerosene oil fire tester, and with the following result:

One sample exploded at 78° F.; one at 84° F.; one at 86°; three at 88°; two at 90°; two at 92°; one at 94°; two at 98°; one at 100°; one at 102°; one at 104°; one at 106°; one at 108°; two at 110°, and one at 114° F. Thus it will be seen that eight only out of the twenty-one samples stood the test of 100° F., and only five out of the twenty-one are sufficiently free from explosive matters to be safe, and that ought to be allowed under any circumstances whatever, to be kept in market.

In conclusion, let me assure you, that one barrel of the explosive compound is positively more dangerous to property and life than one hundred barrels of the preparation that will stand the test of 110° Fahrenheit.

The result of the above report was the adoption of an ordinance by the City Council, providing that no kerosene oil should be sold in the city that would not stand the fire test of 110° F., created the office of Inspector of Kerosene, and defined his duties, and also provided how petroleum oil, or any of its products, should be stored.

The ordinance gave general satisfaction, and the result was a decrease in the number of accidents occurring from the use of poor kerosene, and so continued for several years.

In May, 1877, the following statement appeared in the *Daily Journal*:

“The alarm of fire, Saturday night was caused by the explosion of a kerosene lamp. We had written mysterious explosion, but we can hardly say that any kerosene explosions in our city are mysterious, in view of the facts set forth in Prof. Appleton's report on ten samples of kerosene taken from branded casks and submitted to his chemical inspection.

“A feeling of insecurity must pervade the whole community, for the peril is not confined to those who use explosive fluid, unless a rigid enforcement of the law regulating the inspection of kerosene can restore confidence in the city tests and brands.”

The following are the tests of the ten samples referred to:

<i>Marks.</i>	<i>Burning Point.</i>	<i>Marks on Burels.</i>
No. 1 .....	100° .....	120°
" 2 .....	90° .....	122°
" 3 .....	106° .....	122°
" 4 .....	94° .....	120°
" 5 .....	100° .....	None.
" 6 .....	104° .....	120°
" 7 .....	88° .....	120°
" 8 .....	104° .....	125°
" 9 .....	104° .....	122°
" 10 .....	108° .....	123°

It will be observed by the above report, that the oil tested, is nearly as low test as that tested twelve years ago, when there was no Inspection of Kerosene.

At a recent meeting of the "Providence Franklin Society," I read a paper upon "The Explosiveness of Kerosene Oils." As portions of it are applicable in this connection, I reproduce it here.

In the early days of the discovery of kerosene oil, it was distilled from bituminous coal, and so much pains was taken in its manufacture, that it was but seldom that any accident occurred from its use. It was only after the discovery of the immense quantities of petroleum oil in Pennsylvania that its cheapening was practised.

And during the past few years, the competition in price has become so great, that its usefulness has almost been exceeded by its dangerous qualities. The dealer not being satisfied with it as it comes from the manufacturer, let it be ever so poor, still further reduces its quality, by adding naphtha to such an extent, that it is unsafe and unfit to use for illuminating purposes. It is true that this mixed oil will not always explode, and can be burned in lamps in comparative safety, under certain conditions. When the lamp is full, no vapor can be evolved, and if a match were thrust into the oil, it would be immediately extinguished. Not so, however, if the lamp is put in a warm place and is only half full of oil. Then, as the oil is consumed, its place is filled with an invisible vapor, which will instantly explode when it comes in contact with the flame; or if there should be any defect in the top of the lamp, the vapor would escape, and there would be an explosion, or the vapor might be forced in contact with the flame in the act of blowing down the chimney, a practice that is extremely hazardous, and should never be done, especially when oils of a low grade are used.

Almost all of the northern states have passed laws forbidding the sale of kerosene that will explode at a lower temperature than 110° F. Experience, however, has shown that the explosive point should have been placed at 125° F., instead. Iowa has recently passed a law, compelling 150° F. as the fire test, and all dealers who sell oil of a lower test, are liable to both fine and imprisonment.

It will usually be found that when kerosene lamp explosions take place, as they often do at this season of the year, the lamp was in a very warm place, and the oil used of a lower test than 110° F. About a year ago I procured some half-dozen samples of kerosene oil from the stores where it was for sale, and found that none of them stood a higher test than 100° F.

This season I have done the same thing, and find the kerosene offered for sale, 10° F. poorer than that sold last year, none of the samples standing a higher fire test than 90° F.

The facts to be deduced from the reports and statements above mentioned are, that there are thousands of barrels of kerosene sold in this State every year, from 10° to 25° below the lawful fire test, to the great danger of loss of life and property.

Kerosene oil is a mixture of several elements, which under certain conditions, is of a highly dangerous character, and its natural qualities and phases can best be understood by those who are fully conversant with its chemical properties; and so much depends upon the reliability of its fire tests, that the office of inspector of kerosene should be filled by a practical chemist, or by those who are fully competent to perform its duties.

The State laws, in relation to the inspection and sale of kerosene, need revision in some particulars, which it is hoped will be done at the next meeting of the General Assembly.

Very respectfully yours,

H. H. BURRINGTON.

Chemist and Druggist.

PROVIDENCE, Jan. 1, 1879.





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# MEDICAL TOPOGRAPHY

OF RHODE ISLAND.

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BY

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The following paper is a modification of a portion of a report, made to the American Medical Association, as a member of a Special Committee on Medical Topography.

# MEDICAL TOPOGRAPHY

OF THE STATE OF RHODE ISLAND, WITH A FEW SUGGESTIVE STATISTICS.

The State of Rhode Island and Providence Plantations has the smallest territory and the longest name of any of the States of the American Union. In the report on the census of the United States, its area is said to be 1,306 square miles. This, however, is greater than the actual extent of the land of the State, or the aggregate area of its several townships, and must be an estimate including a considerable portion of the waters inclosed within its boundaries. The actual area of the towns of the State; according to the most authentic maps, amounts to not much more than 1,050 square miles. Before the exchange of territory with Massachusetts, in 1862, the area of this State was 1,046.4 square miles. That exchange increased somewhat the territorial extent of Rhode Island. The forty-second degree of north latitude passes through this State, very near its north boundary line.

The most prominent geographical feature of the State\* is Narragansett Bay, about thirty miles long, and twelve miles wide at its broadest part. The principal mainland is a tract measuring more than forty miles from north to south, and twenty from east to west, and bounded on the west by Connecticut. The greater part of this tract is bounded on the east by Narragansett Bay, and its tributary, Blackstone or Pawtucket river; the northeast corner of it, being the town of Cumberland, is east of that river. A second, much smaller division of the State, lies on the east of the Bay, and of the navigable part of Pawtucket river; it is from two to four miles wide, and is divided into two parts by Mount Hope Bay, which enters the Narragansett from the

\* To follow geographical and geological descriptions, see map of Rhode Island, preceding the title page.

northeast. Thirdly, the islands form a very important division of the State. The island which gives name to the State fills up a large part of the width of Narragansett Bay in its lower half. There are other inhabited islands in the Bay; and Block Island, more than ten miles off shore, in the Atlantic Ocean, is a well-peopled town.

The early settlements of the State were mostly on the islands and shores of the Bay, and at its head. All the important villages which grew up before cotton manufactures were introduced were near the water. We may defer, for the present, an account of Providence, which is at the head of the Bay. The other places have depended partly on commerce and fisheries for their support, and have not grown as rapidly as the rest of the State, with one or two exceptions. Their climate is tempered by the Bay open to the south, and by the Gulf Stream, and is more equable than that of more northerly parts of New England. Newport, the largest of these towns on the Bay, was an important seat of commerce before the Revolutionary War, and is now a summer resort of unsurpassed attractions; it is famous for its "delicious and cosmetic climate," modified by the direct breezes from the Atlantic Ocean. The part of Newport occupied by villas and hotels enjoys these advantages of air and situation to the full; but most of the residents of this old town live on the side toward the harbor, where the houses are quite crowded, and the air is more confined. The population of Newport is more than 10,000. The city has not been free from severe visitations of epidemic disease, scarlatina having been very fatal there in the winter of 1857-1858, and typhoid dysentery in the summer and autumn of 1863.

The western portion of the State is occupied by the granitic rocks, mostly gneiss, forming hills of moderate elevation, of which the general direction is from north to south. The whole tract of country from Western Connecticut to Narragansett Bay has this general character. In the western part of Rhode Island, the larger streams are altered in their course by draining eastwardly toward Narragansett Bay; except in the southern towns, where they run toward the southwest, parallel to the general trend of the coast, and empty into the Atlantic Ocean. Still, the small beginnings of these streams often show the influence of the prevailing north and south course of the hills. The gneiss of Western Rhode Island is continuous with that of Central Massachusetts. That portion of the State is generally blessed with plenty of good pure water.

This granite tract is not generally densely inhabited, the most populous parts being the manufacturing villages which line the streams

that furnish water-power. Some of these are not as favorably situated for health as the higher land between them. The houses of the operatives, which are in most villages owned by the proprietors of the factories, are too often built near the level of the streams, subject to the damp and mists of the low valley, the wells being fed more or less from the river-water, which contains organic matter from vegetable and other decomposition. In the hot and sickly season, these valleys are apt to be either sultry at night, or else the temperature falls very much and rapidly. We shall have occasion to give some details on this point, in speaking of dysentery, which appears every August and September in the lower lands of this western region of the State.

As we approach Narragansett Bay, a new geological character modifies the scenery and soil. A basin occupied by the coal-bearing rocks dips under the Bay, reaching a part of each side. The western boundary of this basin passes from near the northeast corner of the State, and runs in an irregular curve a few miles west from the shore of the Bay, till it meets that shore some twelve miles from the ocean. South of this point, the granitic rocks extend quite to the Bay, and indeed, encroach on the southwestern part of its largest islands. Near this western boundary of the basin are many marks of geological disturbance, dislocated strata, metamorphic rocks, and beds of iron and lime. On the east side, the granite reappears in the towns south and east of Mount Hope Bay, and at Mount Hope. This basin, as it enters the State from the northeast, is over fifteen miles wide, and narrows toward the south. The dip of the rocks in all the western part of the basin is toward the east, sometimes southeast, sometimes northeast, and sometimes with great variations in small space. East of Pawtucket river and of the most northerly part of the Bay, the strata still dip eastwardly, draining the soil, not toward the Bay, but toward ponds and small fresh-water rivers. North of Mount Hope, toward the town of Warren, the dip is northerly; in the towns south of Mount Hope Bay, and along the eastern shore of the island of Rhode Island, there is a westerly dip, being the side or wall of the basin. The main rocks of this formation are coarse and fine conglomerates, slates and shales, often containing vegetable impressions.

Some points in the topography of towns lying on the east side of the Bay and Pawtucket river, within the limits of this basin, ought not to be omitted here.

The town of Warren has a small area, and most of its inhabitants live in the village, which is situated on a rather low and level tract, having Warren river, half a mile wide, on the north of it, and a cove

emptying into that river, on the northeast of the village. The soil is underlaid by hard clay. The strata in the hill south of it dip toward this low land. At very high water, the marshes adjoining the village are liable to be overflowed. There is no barrier to shelter this village from the northeast winds coming over this broad expanse of water. The compact part of Bristol is south of the hill which divides the township from Warren; it is sheltered on the north and east, and open to the Bay toward the south. It has been shown by bills of mortality kept for several years, that deaths attributed to consumption are considerably more frequent in proportion to the population in Warren than in Bristol; while Bristol has suffered more from zymotic diseases, such as scarlatina and summer complaints. In a series of years the deaths from consumption were in Warren about twenty-three per cent. of all; in Bristol, about thirteen per cent. In the former place, about one in every 275 inhabitants died annually from consumption; in the latter, about one in 450. These results were published some years ago in the Second Registration Report of the State and in Reports since, very similar statistics are given. It is true that the vagueness in the use of terms throws a shadow of doubt over any such results; but in each town the causes of death were usually ascertained from physicians; in Warren the bills of mortality were kept by an eminent physician of that town; and we know no reason to suppose that any difference in the nomenclature of disease prevailed in the two places.

We have also some interesting testimony from Pawtucket, which we received in a letter from Dr. Sylvanus Clapp, a distinguished physician of that place. The village of Pawtucket lies on both sides of Pawtucket river, at the head of its navigable portion.

Dr. Clapp writes: "After a few years' observation, I became satisfied that consumption was much more prevalent on the east side of the river than on the west. Subsequent observation has clearly demonstrated the fact; there being a fraction over two deaths on the east to one on the west, in proportion to the population. This I gather from the records of the town, as well as my own.

"The Pawtucket or Blackstone river runs a little west of south; the land rising on each side of the river about eighty feet above the level of the water. The tides come up to the falls. The land rises more abruptly on the east than on the west side. As to geological formation, the conglomerate or grauwacke, alternating with clay-slate, occurs abundantly in regular strata, which run north and south, and dip about 80° to the eastward. The dip of the rock is the same on both sides. All the springs on the west side run directly into the river,

while on the east side they run in a southerly direction to the river. The soil on the east side contains more clay, and springs are much more abundant. Then there is a large pond, situated at the edge of Seekonk Plain, and not more than half a mile from the river, directly east of the village; this, when full, must cover 25 or 30 acres. It is situated higher above tide-water than the greater portion of the village. The wells, for the most part, are but a few feet below the ground, the water coming near the surface in the spring of the year. Some of the cellars in the lower streets contain more or less water every spring.

These observations agree quite well with the general results of inquiries made by Dr. Henry I. Bowditch, of Boston, and presented in the discourse delivered by him before the Massachusetts Medical Society, in the year 1862. The following extracts show the drift of his views: "I believe that all towns, parts of towns, houses even, that *rest on damp, cold soils*, are by that very fact peculiarly liable to the prevalence of consumption. I believe that similar locations *near wet meadows, rivers, marshes, &c.*, though less subject to the law, are nevertheless in a lesser degree, promoters of consumption in the families resident thereupon." He also shows a similar influence of north and east winds blowing over water.

In the western part of Providence city, and in a tract extending about ten miles south, and six miles north from it, the carboniferous rocks are overlaid by deposits of gravel and sand, with some layers of clay, forming a pretty level and not over-fertile region.

Over all these formations the "drift" common in all parts of New England is found, with its usual character of gravel and boulders.

There are no large alluvial tracts; and no very high hills, nor large rivers in Rhode Island. We doubt if any point in the State reaches a height of six hundred feet above the level of the sea. Still, the rivers have a considerable fall; in many parts they are narrow and rapid, affording excellent motive power. This fact has had a most important influence on the growth of population, the industry and social and sanitary condition of the State.

The soil is not fertile, compared with large regions which have now been brought into easy communication and competition with us. Still, it is probably more capable of yielding a profit to skilful husbandry, on an average, than the soil of Massachusetts. The northern towns were long ago celebrated for their orchards; the southern towns of the main land export great quantities of poultry; and the large islands con-

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1 Communications of Massachusetts Medical Society, vol. x. p. 422.



tain most beautiful tracts of farming land. But the agricultural industry of the State is far less important, in proportion to its population and wealth, than it was many years ago.

The city of Providence contains nearly forty per cent. of the entire population of the State. It is situated at the head of Narragansett Bay, Pawtucket river forming its eastern boundary. It was originally laid out between that river and Providence river, a mile or two farther west. But the city has grown toward the west, till now more than three-quarters of the population live west of Providence river. This river, with a broad cove, through which the tide ebbs and flows, divides the city into an eastern and western portion. The former lies mostly beneath and upon a ridge which rises by a steep ascent to a height of nearly 200 feet. It rests on stratified conglomerate (grauwacke), overlaid with gravel; the well water is generally abundant, cold, and clear; the uneven surface gives excellent opportunities for drainage. Some streets on this side of the river are low and shut in by higher land on all sides, and mostly inhabited by families not in the best sanitary conditions. On the west side, most of the residences are built on the plateau of gravel and sand already described; this was formally continued toward the river by sandy hills and low, wet land, which has now been reduced to a regular and convenient slope. There was formerly difficulty in obtaining good water here; but very good water is now abundantly supplied to this, and all other parts of the city, from the Pawtuxet, a river about six miles distant. A good deal of made land on this side is now covered with busy streets.

The higher parts of the city are generally occupied by the wealthier and more comfortably situated classes; the poor and laboring class, including a large part of the foreign-born live more on the outskirts and the lower land.

The City Registrar, in his annual report for 1859, mentions the following favorable circumstances in the topography of Providence:

“1. The very great inequalities of the soil within the limits of the city, giving easy and efficient drainage; the speedy removal of surface filth, and a free circulation of air. 2. The comparatively scattered location of the dwellings. 3. The numerous trees and gardens in most portions of the city. 4. The almost total absence of cellar tenements and underground population. 5. The absence of *large* tenement-houses, such as are found in other cities. 6. The absence of narrow courts and closed lanes. 7. The open space of tide-water through the centre of the city.”

The most complete, long-continued, and available meteorological records kept in the State are those of Professor Alexis Caswell, D. D., the observations being taken three times a day, with very slight interruptions for forty-five years, on College Hill, Providence.

Rev. Dr. Caswell having deceased January 8, 1877, no reliable records of meteorological changes for the years 1877-'78 are available.

The following tables were compiled by Dr. E. M. Snow, for the Registration Report for 1876, from observations made during that year, by Dr. Caswell:

TABLE I.

*Showing the mean altitude and range of the Barometer, the prevailing winds, the mean relative humidity, the mean cloudiness of the sky, the number of days of rain or snow, and the quantity of rain and melted snow, for each month of the year 1876, and compared with the average for 45 years.*

MONTHS.	Mean height of the Barometer reduced to 32° Fahrenheit, and to the Sea Level.	Range of Barometer.	NUMBER OF DAYS OF PREVAILING WIND.				Relative Humidity.	Mean Cloudiness of the Sky.	Number of Days of Rain and Snow.	RAIN FALL.		
			North and East.	East and South.	South and West.	West and North.				Rain and Melted Snow in Inches.	Monthly.	Compared with average for 45 years.
												From January First.
January.....	30.008	1.224	3	5	8	15	77.7	0.49	11	1.28	1.96	1.96
February.....	30.080	2.080	7	4	5	13	76.5	0.49	12	4.42	1.34	0.62
March.....	29.966	1.178	6	9	6	10	72.7	0.52	9	9.75	5.85	5.23
April.....	29.876	0.932	6	3	8	13	56.6	0.50	7	4.24	0.32	5.55
May.....	30.026	0.822	7	11	6	6	76.2	0.44	9	3.23	0.41	5.14
June.....	29.980	0.612	6	11	8	4	73.9	0.46	9	1.40	1.99	3.15
July.....	29.964	0.492	7	6	12	6	71.6	0.36	11	4.14	1.02	4.17
August.....	30.049	0.540	6	11	7	7	76.0	0.29	3	1.82	2.43	1.74
September.....	29.958	0.746	11	5	8	4	78.0	0.54	11	5.73	2.61	4.35
October.....	29.960	0.794	2	5	8	16	82.5	0.41	4	2.15	1.36	2.99
November.....	29.935	0.866	16	1	3	10	81.4	0.67	10	6.95	2.91	5.90
December.....	30.156	1.564	7	1	2	18	76.0	0.55	9	5.25	1.45	7.35
Whole Year.....	29.999	2.080	84	72	81	122	73.3	0.48	105	50.36	7.91	7.91

TABLE II.

*Showing the mean temperature compared with the mean average for 45 years, the highest and lowest temperature, and the monthly range, the mean daily range, and the greatest change in 24 hours, for each month of the year 1876.*

MONTHS.	THERMOMETER.					GREATEST CHANGE IN 24 HOURS.	
	Mean.	Compared with aver- age of 45 years.	Highest.	Lowest.	Range.	Mean Daily Range.	Degrees of Rise or Fall of Thermometer.
January .....	31.°1	4.°5+	67.	9.	58°	8.°6	28°f
February .....	28. 3	1. 2+	57.	2.	59	9. 1	52 f
March .....	33. 2	0. 6—	62.	8.	54	10. 8	25 r
April .....	43. 9	0. 8—	67.	25	42	11. 8	22 r
May .....	54. 8	0. 3—	82.	34	48	13. 8	30 r
June .....	68. 2	2. 8+	89.	44	47	14. 8	27 r
July .....	74. 0	3. 4+	92.	53	40	14. 4	22 r
August .....	68. 8	0. 1—	90.	49	41	15. 2	22 r
September .....	59. 4	2. 5—	87.	44	43	10. 9	20 r
October .....	48. 1	2. 8—	68.	26	42	14. 3	22 r
November .....	40. 8	0. 8+	66.	21	45	8. 6	23 f
December .....	22. 9	6. 6—	44.	2	42	7. 1	33 f
Whole Year .....	47.°8	0.°1—	92°	—2°	94°	11.°6	33°f
							Dec. 16th.

The population of the State is probably somewhat more than 260,000. By the census taken in 1875, it was 258,239. Adopting what we believe to be the correct statement of the area of the State, it is more densely peopled than any other State. We make the number of inhabitants to the square mile to have been, in 1875, in Rhode Island, 244.9.

In ten years preceding the census of 1875, the population increased 39.61 per cent. The gain is greatest in the city of Providence and the adjacent towns. The manufacturing villages and townships also increased far more rapidly than the purely farming towns. Several of these are nearly stationary, or even lessening in the number of inhabitants. Thus there is a marked tendency to centralization, the growth being principally in Providence and its neighborhood, in villages where water-power is abundant and convenient, and in a few points which are favorably situated for fisheries and navigation.

This disproportionate growth of the compact and manufacturing places depends in a great degree on the influx of foreign-born inhab-

itants with their families. The number of foreigners in the State according to the census of 1875, was 71,630.

In 1850 the population of foreign birth in Rhode Island comprised 15.66 per cent. of the whole population, in 1860 it was 21.46 per cent., in 1870, 25.48 per cent., and in 1875, it had increased to 27.73 per cent.

The foreign class are found to have a larger proportion of adults in the marrying age, to be more disposed to marriage in hard times, and to have on an average more children to every marriage, than the native class. Hence, a large number of children are growing up, who are born here, but in all their associations, their early training, and the sanitary, social, and moral influences that surround them from their infancy, properly belong to the foreign class. The distinction by *parentage*, therefore, becomes more important than that by *nativity*. By far the largest part of the foreign are Irish.

There were in the State, at the time of the last census, 6,271, colored inhabitants, including a few partly of Indian descent. The colored inhabitants are so few that they have little effect on the general character of the statistics. They usually report more deaths than births, and are particularly liable to consumption. They are thought to be somewhat less subject to epidemic diseases than the whites. In several years, the registered deaths by respiratory diseases among the colored were three times as many as those by zymotic diseases.

The mortality of Rhode Island is very fully illustrated in the annual reports on registration of births, marriages and deaths:

“The number of deaths reported in Rhode Island in 1877, according to the Registration Report of Dr. E. M. Snow, was 4,450; this was 334 more than in 1876, and more than have been recorded in any previous year. The death rate for the year as given on page 48, was one to 58.03 of the population, as given in the census of 1875, or 17.2 in each thousand. In 1876, the rate was one death in 62.7 of the population, or 15.9 in each thousand; in 1875, it was one death in 59.8, or 16.7 in each thousand.

As a large proportion of the deaths occurred in Providence city, which has so large a share of the population of the State, we give the population, number of deaths and rate of mortality separately for the city and the rest of the State:

	Population.	No. of Deaths, 1877.	One Death in	In each 1000.
Providence City.....	100,675.	1,388.	51.9 or.....	19.25
Rest of State.....	157,564.	2,512.	62.7 or.....	15.94

The difference in mortality between the city and the rest of the State is not so great as it was in 1876, which was the first year in which the distinction was made. It should be remembered that in some towns in the State the returns of deaths are quite incomplete, which fact will account for some of the difference between Providence and the rest of the State."

The following Table from the same Report gives thirteen principal causes of death in Rhode Island, and shows the order in regard to the number of deaths from each, in each of the last three years, and also in the aggregate of deaths for twenty-two years and seven months, from June 1st, 1852, to December 31st, 1874:

1877.	1876.	1875.	June 1st, 1852, to Dec. 31st, 1874—22 yrs. 7 mos.
Whole Number....4,450	Whole Number. ...4,116	Whole Number....4,317	Whole Number....64,514
Consumption..... 661	Consumption..... 655	Consumption..... 650	Consumption..... 10,651
Diphtheria..... 492	Pneumonia and Conges. of Lungs 339	Pneumonia and Conges. of Lungs 400	Old Age..... 3,493
Cholera Infantum. 259	Cholera Infantum. 250	Cholera Infantum. 318	Pneumonia and Conges. of Lungs 3,471
Pneumonia and Conges. of Lungs 226	Old Age..... 241	Old Age..... 216	Cholera Infantum. 3,175
Old Age..... 213	Heart, Diseases of. 166	Heart, Diseases of. 186	Scarlatina..... 3,023
Heart, Diseases of. 182	Apoplexy and Paralysis..... 165	Scarlatina..... 185	Fevers, Typhoid, &c..... 2,522
Apoplexy and Paralysis..... 181	Diphtheria..... 159	Fevers, Typhoid, &c..... 170	Heart, Diseases of 2,295
Cancer (all kinds). 135	Fevers, Typhoid, &c..... 126	Apoplexy and Paralysis..... 166	Apoplexy and Paralysis..... 2,067
Fevers, Typhoid, &c..... 134	Accidents (all kinds)..... 114	Accidents (all kinds)..... 130	Dysentery..... 1,975
Accidents (all kinds)..... 132	Cancer (all kinds). 106	Convulsions and Fits..... 100	Accidents (all kinds)..... 1,973
Croup..... 95	Croup..... 102	Croup..... 96	Convulsions and Fits..... 1,357
Convulsions and Fits..... 83	Convulsions and Fits..... 89	Cancer (all kinds). 95	Croup..... 1,300
Scarlatina..... 62	Scarlatina..... 80	Diarrhoea..... 70	Hydrocephalus.... 1,054

In examining the diseases to which deaths are ascribed, we are well aware that scientific precision of diagnosis cannot be expected, in records gathered from the clerks of different towns, where the amount of general information and the modes of using terms vary. The law requires that the cause of death be certified by the attending physician; and in many parts of the State this is done. But the defects are great enough to deprive the results of value as the basis of exact and general deductions. Still, it must be remembered that many of the more important diseases are so easily diagnosticated and so generally known, that the figures may be trusted, as showing, with essential accuracy, the proportion of deaths due to them in each successive year, and as illustrating the laws of the several diseases.



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# DIPHTHERIA.

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BY

JAMES H. ELDREDGE, M. D.,

OF EAST GREENWICH.

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## DIPHTHERIA.

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The great prevalence of diphtheria in this State, and I may say everywhere throughout the country, the great mortality which attends it, and its very distressing character, have very properly suggested it as a subject for investigation and discussion. It is not without distrust of my ability to do justice to a subject of so much importance, that I have, in obedience to your commands, Mr. President, prepared a short paper, as an opening to a discussion, which I hope may bring out from others something of more value than anything I can present myself. The first death from diphtheria was recorded in the town of Warwick in 1861, and in East Greenwich in 1864. Since that time up to the first of January of this year, the records show from this cause eighty-one deaths in these towns. They have occurred in the following order: In 1861, 12; 1862, 5; 1863, 5; 1864, 11; 1865, 5; 1866, 2; 1867, 1; 1868, 2; 1869, 5; 1870, 7; 1871, 11; 1872, 2; 1873, 2; 1874, 7; 1875, 3; 1876, 2. Four in the month of January, 1 in February, 2 in March, 4 in April, 6 in May, 6 in June, 5 in July, 11 in August, 5 in September, 8 in October, 15 in November, and 14 in December. Sixty-six of these were under six years of age; about equally divided between the sexes. It has at no time been epidemic, generally breaking out, as it seemed, sporadically, in different localities, confining its ravages to one family, or to a very small neighborhood, carrying off three out of five, or four out of seven children in a family, and then disappearing for a whole year, or showing itself three or four times in this way in some years; the farm houses in the country being quite as often selected as the more crowded houses of the village. In the summer of 1866, in the month of August, three children in the family of a well-to-do-farmer died in one week, and there were in that year only two other deaths from this cause in the town of

Warwick. These eighty-one deaths may be said to represent about five times as many cases, for the proportion of fatal cases in these circumscribed, local epidemics has been, as near as I can estimate it, about 20 per cent. The disease as it was first recognized in 1861, had the same malignancy that it has now, one of its features being the fact that the first cases in these local outbreaks were generally the fatal ones. In the year 1877 there have been reported in the towns of Warwick and East Greenwich, forty-seven deaths from diphtheria, more than from any other one disease, diphtheria having this year reached that bad eminence so long held by consumption. Of these reported deaths, one was in April, four in June, one in July, four in August, twelve in September, twelve in October, four in November, and eight in December; thirty-five were children under six years of age, ten were over six and under ten, and four over ten; twenty-four males and twenty-three females. These forty-seven deaths represent approximately two hundred and thirty-five cases in a population of about fifteen thousand. This is the sum of my experience with diphtheria since its first appearance under its proper name. I presume it differs but little from the average practitioner in the country, and that other parts of our State have had about the same proportion as that of Kent County over which my personal observation extends, and that the increase that we had this year has not been peculiar to these towns.

These statistics confirm the statements of Dr. Snow, that the fatal forms of diphtheria are very much confined to children under ten years of age, and that its period of greatest prevalence is in the fall and early winter months.

The first question which presents itself in the discussion of this subject is its history: Is diphtheria a new disease, which has shown itself and prevailed in an epidemic form only in the last half century? This is rather a popular than a professional inquiry, and may be answered without hesitation in the negative. This disease is known to have existed in remote times, and is described by the earliest medical writers. It is only from the fact that it has been brought to notice under a new name, which its most important pathological feature has given it, that this question has in any way arisen. As the *malum Egyptiacum*, *Angina maligna*, *Cynanche maligna*, and as *scarlatina* without efflorescence, diphtheria has been recognized and accurately described by the standard authorities of the last century. In the *Encyclopedia of Practical Medicine*, of Forbes, Tweedie and Conolly, published in England about 1842, and in this country republished, under the supervision of Dr. Dunglison, in 1845, no place is given to diphtheria as a distinct

disease, but it is accurately described, and the work of Bretonneau referred to in the article on diseases of the throat, and again under croup by Cheney, and the latter writer protests against classing with croup, a disease in which there are marks of septic changes in the blood, and in which the pulse is but little accelerated, the skin harsh and dry, the breath fetid, and the debility extreme. Under scarlatina, varieties of the disease are described as scarlatina without efflorescence, which would now be called diphtheria. I can myself remember cases of this kind in my father's practice, and in the early years of my own, scarlatina without the rash, which would now be called, and very properly, diphtheria. It will be generally admitted that this is not a new disease, but that it was recognized and known to prevail extensively as an epidemic in different countries, and that in the due course of pathological investigation, its characteristic features have been found sufficient to give it a place in modern nosology, and separate it from the kindred diseases with which it has been confounded.

What are the causes of diphtheria, and to what can we attribute its marked increase at the present time? There can be no doubt that faulty hygiene, or disregard of the laws that regulate the common affairs of life in every village and in every household, will contribute to the increase and aggravate the malignancy of this disease as well as of all other diseases. Where there are such decided characteristics, such peculiar features, it is reasonable to suppose there must be some specific cause, some noxious agent which breeds diphtheria and nothing else. Whether this noxious agent may be the spore of some fungoid vegetation, which pervades the atmosphere, at certain times, everywhere, but, like the spore of the mushroom, only starts into active growth under favorable conditions of soil and temperature and proper degree of moisture, is a proper question. Seeds of many plants we know remain dormant for many years, sometimes for centuries, and then, under changes, germinate and grow as if recently planted. May it not be so with the seeds of disease, and of this disease especially, everywhere present, but only starting into active life under the conditions which favor their growth; \* these conditions being all those depressing influences which we may sum up under faulty ventilation, defective food and impure water, and the peculiar attraction which the system presents between the ages of two and ten years, and the favoring influences of certain seasons.

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\* An intelligent gardener making up his beds for mushrooms, bestowed much more care with the compost and the amount of light and heat and moisture, than with the seed. Indeed, he said he "would rather take his chance for a crop without sowing seed, than with careless preparation and seed in profusion."

Whether the noxious agent which may be supposed to be the specific cause of this malady is a certain fungoid, cryptogamic vegetation, which attaches itself to its favorite locality, producing first a local disease, and then secondarily, affecting the general system by absorption, or whether the reverse is the order in which the symptoms progress, is not yet fully settled, and is a point for discussion, and an important one; for if we can arrest the disease by destroying at the outset, before the system is affected, these local manifestations, its further progress may be prevented. My own observation, which is, of course limited, leads me to believe that diphtheria does not differ from other diseases of kindred nature, that it has its period of infection and incubation, a series of premonitory symptoms, and then the local affection and general constitutional disturbance.

Whether it is contagious or infectious is another point upon which there is a great difference of opinion; but this, after all, may be more a difference in mode of expression than any great difference in meaning. If we say that a disease is not infectious, unless it is almost invariably the rule that those who are exposed to it, unprotected, take it, as in the case of small pox or measles, then few diseases are infectious; but if, on the other hand, we call all those diseases infectious which a person is more likely to contract by coming within range of their influence, than by keeping out of it, then the number of infectious diseases is very large. If this latter rule applies, diphtheria is clearly infectious. The risk of contracting the disease is much less kept at a distance, than permitted to approach it. When, however, cases occur in clusters, as they generally do, it may not be the infection, but the primary cause which produces it, the same in the successive cases as in the first, and this view is supported by the fact that the first cases are generally more violent than the last, when we might be led to expect that the later cases, if the result of infection, would be more malignant as the virus became more concentrated. There is no dispute about the fact of its contagious character. It is not an unwise precaution to isolate all cases as far as practicable, and to keep all children under ten as far removed as possible, from the presence of the sick room.

We can hardly err in making a diagnosis of a well marked case of diphtheria, for it presents appearances which are seen in this disease alone; and the train of symptoms which follow are such as follow diphtheria and diphtheria only. All cases, however, are not well marked and there may be much uncertainty in deciding at the outset the true character of some slight, obscure or irregularly developed case. All inflammations of the fauces should not be hastily pro-

nounced diphtheria, but only when we are obliged to do so by the pathognomic sign which this disease presents, should we use the formidable name. Not unfrequently the messenger who comes for the physician announces the nature of the disease we are to meet; and generally the announcement is right, although neither the messenger nor any one in the family or neighborhood may have seen a case before.

After a period of malaise varying from a few days to a few hours, a swelling and soreness of the throat is complained of, at the same time there is swelling of the glands of the throat and neck not only immediately outside the inflamed parts within, but under the chin and on the neck behind the angle of the jaw. If examined carefully a white patch, like a piece of soiled white kid, will be seen adhering to the surface of the tonsil or adjacent parts. This spot is not like a cut out ulcer lined with the membrane; but a patch loosely laid on to the inflamed surface, but found to be incorporated with the mucous membrane if the attempt is made to remove it.

The outward swelling of the glands of the throat and neck is a feature almost as marked as the false membrane within—as if these faithful sentinels had exercised their functions to the utmost extent to exclude from the blood the poison which the absorbents had taken up. As the disease progresses, the nasal passages are invaded, the peculiar inflammation extends through the lachrymal duct to the eye and to the ear through the eustachian tube, and spreads downward to the larynx and trachea, too often with fatal results. The countenance is puffed or swollen and of an ashy hue. The blood is vitiated and extravasated into the tissues and escapes in hemorrhages in every form; and the fetor from all discharges is very marked—sometimes plainly perceptible before entering the sick room.

This is a brief description of a case so marked as to be recognized by those who see it for the first time.

When these decided manifestations are not present, we may suspect diphtheria if the constitutional symptoms are disproportionate to the local affection; where there is long continued loss of appetite, and loss of strength and of flesh; and we can have no hesitation when any of the forms of local paralysis which are peculiar to diphtheria show themselves.

With scarlet fever diphtheria has been often intermixed and confounded. In the first we have not only the efflorescence, but high febrile excitement, high temperature and rapid pulse through the whole course of the disease. The swollen glands frequently suppurate

and local and general dropsy, with albumenuria follow, and not the peculiar forms of paralysis, as in the latter. In scarlet fever a second attack is the exception to a general rule,—in diphtheria, after one attack, there is a tendency to a recurrence, rather than exemption.

Are membranous croup and diphtheria identical? This is a mooted point; but generally admitted to be decided in the negative. Diphtheria may result in croup, but croup will not result in diphtheria. There is false membrane in both, but in croup it originates and is confined to the air passages, while in diphtheria the air passages are affected secondarily; in one the fever is active, in the other typhoid; in one the cases are single, in the other they come in groups; in one the local affection predominates, in the other constitutional symptoms are as strongly marked as the local.

In the prognosis of diphtheria we have the same uncertainties as in scarlatina. Some cases are so slight as hardly to be recognized, but still not free from danger, and these as well as the graver cases, are followed sometimes by symptoms which may prove fatal. Albumenuria, as in scarlatina, is a dangerous and very common complication, the swelling of the sub-maxillary and cervical glands is in some degree a measure of the extent of the disease. Hemorrhages, and fetor of the breath and discharges, are very unfavorable indications. A temperature of nearly a natural standard, and a pulse regular and slow, cannot be taken as a sign of encouragement, as it is in other febrile diseases, nor can the fact that the mental faculties remain, sometimes in the worst cases, unclouded and undisturbed to the last moment of life.

The treatment and means of arrest and prevention are points of far greater interest in the discussion than any others. In a disease so variable and capricious, where at one time we find almost all cases fatal under all treatment, and at another all recovering, whether treated or not, it is difficult to fix upon facts or to arrive at correct conclusions. The treatment is local and general. It is important that in pursuing one we should not ignore the other, on either hand; the difference in opinion in regard to the order in which the symptoms make their appearance, should not materially modify the treatment, although greater or less importance may be put upon local applications, as the opinion prevails that the local manifestations take precedence of the constitutional symptoms, or the reverse. One procedure is not incompatible with the other, and both are necessary. If in the order of progress, the local symptoms come first, even then, at the earliest moment of observation, the system is already affected by the rapid development

and absorption of the fungoid vegetation into the circulation and into the tissues, and into the recesses of the body where no local application can reach them. Nor are the local applications of less importance if the system is primarily affected. The advocates of these different theories do not differ materially in their mode of treatment, so that it is of but little consequence, practically, upon which side one's action is based, being essentially the same. The "savage energy" with which powerful caustics were applied to the diphtheritic patches, by recommendation of Trousseau and others, has long since been discontinued, and milder measures substituted, in the form of antiseptic lotions and gargles, less potent and less disagreeable. We can remember with how much reliance we used the solid stick of nit. silver, or very strong solution of the same, in all these cases, as an essential part of the treatment, and how we learned after a while that a weaker solution answered as well, and finally that the weaker we made it the better it was, and now I believe that it is but little used for this purpose. The chlorate of potassa, with the addition of muriated tr. of iron, or muriatic acid, the sulphocarbolate of soda, permanganate of potash, borax, alum, salicylic acid, and other preparations of this nature, have been found to accomplish all that can be done in the way of gargles, lotions and topical applications.

Alcohol, in its various forms is a good topical application. Lumps of sugar, saturated with spirits of camphor, give relief where the patient is old enough to use it and appreciate it. To sustain the system with food, stimulants and tonics, until the malady has run its course is the chief indication: Milk and eggs and broth and juice of beef, with wine and whiskey and brandy. Milk is generally the most agreeable. The great difficulty is to overcome the repugnance to all food. When it is found impossible to administer it by the mouth, it may be given by injections, as may be the medicines. Quinine as a tonic in one, two or three grain doses, suspended in water with powdered liquorice root, is most reliable, and in this way easily taken. Muriated tr. iron, cit. iron and quinine and salicylic acid, with borax, have all been used with benefit as a change, or alternately with the quinine. Hot vapor and sprays are of great service, and sometimes the only means we have of making topical applications in small children, and sometimes in those of larger growth, who happen to be a little perverse. Cologne or rose water, added to the solutions used makes them more acceptable. Vapor of lime water or of vinegar or of simple water hastens the process of suppuration and detachment of the false membrane. Stimulating applications to the outside are of no service,



and perhaps add to the discomfort. If it is thought that these cryptogamic vegetations, which characterize this disease, can be easily destroyed, either by medicine administered internally or by topical applications, we have but to refer to experiments made for the purpose of testing the power of different remedies. It was found by Oertel that exposure for twenty-four hours to 14° and 7° Fahr., and to boiling water for fifteen minutes, failed to destroy their vitality, or even their power of proliferation. And the same result was obtained by treating with the solutions which we so much rely upon for the destruction of these organisms, chlorate potash, chlorine water, quinine, sulphur, &c. These were no more effectual than hot water or the freezing mixture. Alcohol was found to answer the purpose better than anything.

A very nice point comes up very often for prompt decision. In the management of these critical cases, where the false membrane is found to extend to the larynx and air passages, shall we recommend a resort to tracheotomy or not? Can there be no rule to guide us? If there is such a condition as to give little or no chance for recovery without this complication, if the glands of the neck are very much swollen, if the nasal passages are affected, the complexion bad, and the breath fetid, we should but bring odium upon the operation, if we should resort to it; but if without this complication, there is a good prospect of recovery, if the general system is in a good condition, the operation should be recommended and resorted to as soon as practicable after the extension of the false membrane into the windpipe is discovered, for it is certain that this state of parts does not tend to recovery, and unless relief is given by an operation a fatal result is inevitable. The complications which come in the period of convalescence, and the sequelæ which follow the malady are more troublesome, and more often fatal, than in any other disease. Syncope is a common occurrence, and is always dangerous. It does not appear to be owing to mere debility, but to some more serious cause, obstructions in the large blood vessels or heart. The peculiar vegetations, which are supposed to characterize this disease, are not confined to the surfaces upon which they appear, but pervade the tissues and vessels and form collections, which not only plug the capillaries, but the larger vessels. The forms of local paralysis, which constitute one of the chief diagnostic marks of diphtheritic affections, are not only exceedingly annoying, but sometimes dangerous. Muscular fibres, which are covered by micrococci, are said to degenerate and slough, impairing permanently the parts affected. I have known, during the last summer, two cases of complete paralysis of the throat, so that the voice was not only lost,

but the power of deglutition; fluids of the blandest sort flowing back through the nose, and solids causing alarming fits of strangulation. Both of these cases were fatal from debility. Food could not be taken in sufficient quantity to sustain life, although they were nourished as far as possible by injections into the rectum. The tendency in these cases of paralysis is generally to slow recovery. They do not respond very sensibly to treatment with strychnia, or to galvanism in its various forms, means which are generally resorted to and indicated. Prophylactic measures are all important in times of diphtheritic epidemics. Not only should precautions be taken against infection and contagion, but every care taken to remove those unwholesome surroundings which are to be found almost everywhere, and which increase and aggravate all kinds of disease, and may be said to generate this. That all sorts and conditions seem equally affected, is not a proof that faulty household arrangements do not favor its increase. The modern improvements in the way of cess-pools and covered drains, unless properly constructed, are no better than the unsightly open drains and slop receptacles so common in the farm house in the country; and the convenient bath room and water closet are not always an improvement on the more remote privy. It is well to enquire closely into the quality of the air we breathe, particularly in the night time; what water we drink and what food we eat.\*

I have given in this brief way, Mr. President, the sum of my own experience and observations in this malady as it has appeared in the last sixteen years in that part of the State over which my circuit may be said to extend. Not proposing to offer any new theory, but to express an opinion upon some of those points which may be consid-

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\* During the summer of 1877 the brine accumulated daily in making ice-cream, amounting to three or four pailfuls, was thrown into a pit dug in the garden about thirty feet distant from the well, on the up hill side. Early in the fall the water in this well became brackish and unfit for use. Sometime in November, another well across the street, full one hundred and fifty feet from the place of deposit for the brine, was affected in the same way, the water being so salt as to be perceptible in tea and coffee and altogether unfit for use.

The region about was underlaid with rock fifteen feet from the surface having a dip to the north and east, in the direction of the affected wells. The overlying earth was made up of sand and gravel and the rock was traversed with seams. If, under these conditions, water holding in solution common salt can be carried so far, is it not possible that holding in solution impurities less palpable but more hurtful, it may take the same course? The cess-pool and covered drain are somewhat modern improvements about the better class of farm houses and in the more recently constructed tenements in factory villages. May not the accumulation of filthy water in these bottomless pits, and of other filth in privy vaults in close proximity to the wells contaminate the drinking water in an insidious way, only to be made known by the prevalence of some disease like typhoid fever or diphtheria? And would it not be a wise precaution to have all these receptacles for filth made water tight? and would it not also be a wise precaution so to examine the natural under-ground drainage as not to locate wells in the course of flowage from contaminated sources, even at the expense of inconvenience as to distance, or cost of digging them?

ered as not yet fully settled. I have stated that in the towns of Warwick and East Greenwich, from the 1st of January, 1861, to the 1st of January, 1877, sixteen years, there have been recorded eighty-one deaths from diphtheria; that sixty-six of these were children under ten years of age; that more deaths were recorded in November and December than in any other months, and that the number of deaths may be said to represent about four hundred and fifty cases; that in the last year in these towns, forty-seven deaths have occurred, manifesting the same peculiarities of age and season as in the sixteen previous years. Second—That a disease of such very marked features must have a specific cause. Although, as in other diseases, this noxious, specific agent, whatever it may be, is rendered more actively virulent by any unfavorable conditions of living; that it is infectious, if infection may signify a greater liability in those who are exposed to it than in those who are kept away, but that it is not invariably so, like small pox; that it is contagious beyond a doubt. Third—That it may be taken for scarlatina, from which it differs, however, in some prominent points; the fever is slight after the first few days; the pulse is but little accelerated, and the temperature but little raised. The swollen glands rarely suppurate, and the sequelæ come in the form of local paralysis, and not as dropsical effusion; that diphtheria may be croup, but croup is never diphtheria. Fourth—As to the order in which the symptoms are developed, I am led to believe that the system is generally affected before the local symptoms appear, and that the disease is not arrested, if it were possible to do so, by removing the local manifestations. Fifth—That the prognosis as in scarlatina, is uncertain, as the slightest cases may be followed by grave symptoms which may prove fatal; that the swelling of the cervical glands is some measure of the extent of the disease, and that hemorrhage and invasion of the nasal passages, and the larynx are almost invariably fatal indications. Sixth—That the treatment is with topical applications much milder than those first used; that the constitutional treatment should have for its object the support of the system until the disease has run its course—tonics, food and stimulants—and that it is not possible to destroy entirely the characteristic vegetations with the usual lotions and gargles, even if they could be reached; and also, when in the course of the disease the larynx is invaded we should recommend tracheotomy as early as possible, if the system is in such a condition as to warrant it, and, lastly, that preventive measures are quite as important as the treatment, and they consist of the careful observance of general hygienic rules.

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ON CAUSES OF  
ILL HEALTH AMONG WOMEN.

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## ON CAUSES OF ILL HEALTH AMONG WOMEN.

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Many of the causes of ill health among women having their origin in the fashions and customs of the day are supposed to have but temporary effects, as may be the case sometimes, but we are apt to forget heredity. The things which are truly only of the present, will change whether they are attacked or not; to get at and to prevent evils we must work now for the next generation, looking upon each child as a future grandparent, and teaching it that it owes a duty to its posterity and through them to the world, which they have the power to bless or to curse.

To begin at the root of the matter, each man and woman should consider the prenatal influences of their offspring, and endeavor to make these as perfect as possible, according to the best intelligence and information they have. The health of women during the child-bearing period, both the mental and moral, as well as physical condition, their work and recreations, their surroundings and their thoughts, are reproduced in their children, and while some attention is given to the so-called and much mis-called mother's marks through frights and whims, and which often only show the weak-mindedness and lack of self-discipline of that mother, little attention has been paid to their prevention, or to the good that might be wrought out by the well trained mind and disciplined character of *both* parents.

After its birth immediately there begins a mismanagement which affects its health and longevity. Through ignorance and superstition every hygienic law of food, clothing, bathing and sleeping, is abused.

Then when nature demands active exercise for growth and muscular development, repression is the only idea, the convenience of the adult being considered of more importance than the well being of the child. The primary public schools, presided over chiefly by young girls who have not themselves learned self-government, are governed also by repression and confinement to one position for a length of time difficult even for adults. Until puberty, the sexes are about equal mentally and physically, but then the idea of repression shows itself more forcibly upon girls. The study of anatomy teaches of the growth and development of bones in the growing child. The pelvic bones which have had several centres of ossification begin to unite at about the thirteenth year, three bones joining into one. The sacrum also ossifies more perfectly, completing this process at about the twenty-fifth year. During these years, when the whole future health of the woman, depends upon the perfectness and completeness of this pelvic development, and when girls should be allowed the greatest freedom of muscular movement, *repression* is still more enforced. She must not romp, she must have quiet manners, she must be shut up indoors until her vital powers are reduced. When she does go out she must be dressed to form such a figure as is demanded by the ignorance of fashion; long dresses, the weight at the bottom, furthest from the point of support, the weight and heat of which falls upon the growing pelvis with excessive and unequal pressure, changes the natural gait. Close fitting, if not too tight corsets, misnamed supports, which impede respiration, circulation, digestion and the peristaltic action of the intestines, thus producing one of the chief causes of constipation with all its recognized train of evils, so much more common among women than men; weaken the power of the muscles which aid in child-birth; also pads over the breasts which impede their natural growth and deprives them later on of one of the privileges of maternity. No thought is given to preparing the body to facilitate future child-bearing. The spine is heated and distorted, and though women have and wear more clothes now than did those of the last century, they are ill protected just where most clothing is needed. Cold feet and a hot head is a frequent condition; the feet and limbs are not warmly dressed, the head is heated by false hair and by wearing the bonnet indoors. Much has been said on dress, and efforts made at reform so far as underclothing, and yet even our wealthiest women who have least excuse are insufficiently clad. Efforts in this direction have also had some effect in regard to the size of the waist, but there is still too much compression.

The excitements of social life are greater in this country than in Europe, and girls are allowed them at an earlier age; the late hours and insufficient sleep during the hours authorized by nature, all tend to induce early and excessive menstruation, to disturb the nervous system, and to derange the function of every organ, making us notorious among nations as nervous temperaments and subject to nervous diseases. It is not merely going to places of evening amusement and excitement, as concerts, theatres, balls, &c., but too early partaking in them themselves, as in exhibitions of all sorts. Our public schools set a bad example in this.

Fictitious literature gives girls romantic and unreal ideas as to marriage and domestic life; later, when they come to find the reality different, they grow to hate these cares and become restless for excitement. "*Si votre fille lit des romans a dix ans elle aura des vapeurs a vingt.*"

Among the poorer classes hard work is begun at this time of life, combined with ill ventilated homes, especially sleeping rooms, and such food as does not help in the healthy development of bone. Among the wealthier classes, indulgences in too rich and over stimulating food develop those national diseases, dyspepsia and catarrh. Dyspepsia was entailed upon us by our grandparents, with their salt pork and fried meats eaten by them even through the summer season; now we are passing it on to the next generation by our pies, doughnuts and highly seasoned food; even our school girls must have sweetmeats, cakes and pickles. Out door pursuits and games calculated to create muscular power, are discouraged because they do not accord with the general idea that an appearance of delicacy in form and complexion is more suitable for women. Here, also, we present a contrast to European women. The imperfectly performed light gymnastics drearily gone through with in our schools, is supposed to be sufficient to develop all the muscular power needed. One might as well teach children to play and laugh by rule, so far as any real development of muscle or mental relaxation is obtained. A more healthy performance of natural functions would promote efforts for the prevention of disease and secure more regularly established menstruation with more ease in its performance. "As the importance and relative value of a living being may be estimated by the length of time it takes to attain perfection, I may reasonably infer that the longer the reproductive apparatus lays dormant in women, the stronger will be their constitution, the more harmoniously will its functions be performed, and the more favorable will be the influence of this apparatus on the whole



system.”\* Owing to the various excitements and stimulations above mentioned, first menstruation occurs early in this country and earlier among the higher classes than in the poorer. Unfortunately ignorant of these conditions, many mothers adopt a forcing system by medicines, baths, &c., often thereby destroying good health; while others allow girls to grow up in ignorance of this coming change, and when taken by surprise, the shock, the fright leads them into imprudences which result in hysteria. Many diseases are thus traced to the bad management of girls at puberty. “The effects of a badly passed puberty are seen in an over excitable circulation, excessive nervous susceptibility, dysmenorrhœa, sterility, \* \* \* becoming at last victims of consumption or other disorders of which the foundations had been laid in an improperly conducted physical and moral education.”†

Physiology is taught only in the high schools which a large portion of the future mothers never reach, and there it is taught only partially with much positively needful for the youth, of both sexes, to know, carefully culled out. They are thus left to learn and continue to hand down to posterity, from the ignorance and superstitions of servants, or from the vulgar among their associates and from the obscene literature which is being thrown broadcast among our schools, what they should learn only from parents, or teachers capable of making them respect the highest functions of human nature. If the half time system, which has worked so well in England and Germany, could be introduced into our public schools, at least in the primary and intermediate grades, and the remainder of the time applied to systematic training in industrial work for, and by, both sexes, the working classes of our population would be better prepared for self-support, have a more healthy physical development and become better citizens. The graduates from our high schools are crowded with studies which they have no use for in private life, and which they soon forget, because crammed only to get their averages and percentages of rank, to obtain a diploma, that being the highest and often the only goal and without which they will not easily get situations as teachers, and they are fitted for no other career. They cannot all be teachers, the supply is greater than the demand, meanwhile other fields are waiting for laborers.

I place ignorance among the chief causes of evils, although I am frequently met with the argument that women have had time and op-

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\* “Preservation of the Health of Women,” E. J. Tilt, M. D., England.

† “Diseases of Women,” C. D. Meigs, M. D., Phil.

portunity to learn differently. Time is not so much needed as encouragement, or rather the *cessation of discouragement*. Women often see evils before them, know that they are evils, could be and should be remedied, but they do not know how to remedy them. Complaints are met with the idea that the right lies in making the best of, and being satisfied with what is. It may be suggested here that one remedy lies in the dissemination of *proper* knowledge by authoritative bodies, such as the Boards of Health in the various States. I say proper, because there is so much worse than useless trash learned through almanacs and the advertisements of empirics.

Women have generally been taught that they are to marry, to be mothers, and housekeepers. They have not been taught how to make marriage beautiful; and neither sex is taught the value of a power of adaptation to each other's character, and when the fruit of an inharmonious marriage is nervous and ill-tempered, the blame is laid on Providence, instead of where it rightly belongs, on the lack of knowledge of the laws which that Providence made, and meant should regulate marriage and procreation. But it is not only with the inharmonious marriages, in the best there exists an ignorance of child-bearing and its results, a forgetfulness that motherhood is the crowning glory of womanhood, which leads to an infinity of methods for the prevention of conception not necessary to refer to directly, for those who are ignorant of them are blessed and rewarded in their ignorance, —for those who do use them, there is always the punishment which nature awards her broken laws. I have frequently given my opinion for years past, that this prevention of conception leads to a large part of the diseases peculiar to women. Poor little Pip, in "Great Expectations," spoke as the representative of a numerous class when he said, "I was always treated as if I had insisted on being born in opposition to the dictates of reason, religion and morality, and against the dissuading arguments of my best friends."

I quote from an address by Prof. Maudsley, of University College, London, the following, because I want these ideas more widely known and meditated upon: "Take notice how little people ever think of the power which they have over their own destiny and over the destiny of those who spring from them! How amazingly reckless they show themselves in this respect! They have continually before their eyes the fact that by care and attention the most important modifications may be produced in the constitution and character of the animals over which they have dominion—that by selective breeding an animal may almost be transformed in the course of generations; they perceive

the striking contrast between the low savage with whom they shrink almost from confessing kindship and the best specimens of civilized culture, and know well that such as he is now, such were their ancestors once; they may easily, if they will, discover examples which show that by ill living peoples may degenerate until they revert to a degraded state of barbarism, disclosing their former greatness only in the magnitude of their moral ruins; and yet seeing these things, they never seriously take account of them and apply to themselves the lessons which lie on the surface. They behave in relation to the occult laws which govern human evolution, very much as primeval savages behaved in relation to the laws of physical nature, of which they were entirely ignorant,—are content with superstitions where they should strive to get understanding and to exert intelligent will. They act altogether as if the responsibility for human progress upon earth belonged entirely to higher powers, and not at all to themselves. How much keener sense of responsibility and stronger sentiment of duty they would have if they only conceived vividly the eternity of action, good or ill; if they realized that under the reign of law on earth, sin and error are inexorably avenged, as virtue is vindicated, in its consequences; if they could be brought to feel heartily that they are actually determining by their conduct in *their* generation what shall be predetermined in the constitution of the generation after them! For assuredly the circumstances of one generation make much of the fate of the next.” Thus it is that people pay no regard in marriage to the evils which they bring upon their children; or in their lives to the sins by which the curse of a bad inheritance is visited upon them, and neglect to apply knowledge to the improvement of the race. When through more enlightened education, parental responsibility shall be placed on higher grounds, not only disease, but crimes will diminish, and in time we may “produce, if not a higher species of beings than we are, a race of beings, at any rate as superior to us as we are superior to our primeval ancestors.”\* Too much cannot be said on the subject of heredity until it is believed, understood, and acted upon, for we have only entered upon research in this direction. As there cannot be good wine without fermentation, so every new movement has its opposers to raise discussion; thus “agitation of thought is the beginning of wisdom.” The objection has been raised that the belief in heredity is used too frequently as an excuse for various wrong doings and criminalities. This so far as true is not because the laws of heredity are too well believed and understood, but rather the contrary; and that there

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\* Maudsley.

is a neglect of their proper application, and these cases serve to illustrate that the inheritance was not recognized early enough in the individual and care taken to eradicate it or to stimulate the power and duty of self-control, and such qualities of mind and body as tend to oppose the natural bias, and which, by such care, one of the most fruitful sources of disease and crime may be diminished; for many things harmful to health and character, sound body and sound mind, are under human control. "When deviations or violations of the normal standard of physiology, perfect in structure and healthy in function, are continued through two or three generations, their effects become more marked and intensified. As all these changes are brought about by human agency, the remedy is lodged in the same hands."\* "So to observe nature as to learn her laws and to obey them, is to observe the commandments of the Lord to do them."†

As to housework, with all its monotony of routine, its confinement, often to ill-ventilated rooms, its constant wearying muscular movements, its long hours of work, its lack of change of thought and scene, not one of these conditions changed even during the periods of child-bearing, what wonder that women break down and wear out? What other fate could be predicted for them? These influences can not be salutary either to bodily or mental health. Here, also, ignorance plays a large part. Many persons who consider themselves good cooks would be astonished to be accused of being the cause of indigestion, of diseases of the skin, of the blood, of the nerves, &c., &c., in their families. There is now a movement at work in New York and Boston, and about to begin in Providence, for the training of cooks. Boston has cooking clubs of ladies, not in training for servants, but for their own improvement. These schools are not for the teaching of making doughnuts, pastry and such already too common mixtures and compounds, but to teach hygiene and chemistry, and such principles of physiology, that in the generation to come we shall know what material should be eaten by each individual for the necessities of his or her harmonious and equable growth and development. Such a training school should be encouraged by the whole community. Also, for teaching the preparing of proper nourishment for the sick, to take the place of the wretched slops now too frequently used. Also, training for other kinds of housework, that by more orderly method, time and steps and back-aches may be saved. Much that is valuable has been said and written by practical women on the organization of

\* "The prevention of disease, insanity, crime and pauperism." A paper read before the Conference of Charities, Cincinnati, May, 1878, by Nathan Allen, M. D., Lowell, Mass.

† Maudsley.

household labor; when these ideas meet with more understanding and encouragement, so that they can be acted upon, we shall see fewer worn out women, consequently healthier ones, and healthier offspring.

However good the training it cannot be properly carried out until there is more improvement in the building and arrangement of houses, and for this we need women architects who will best know the necessities of women in this respect. There are in this city thousands of rooms which can *not* be ventilated thoroughly, which are not properly lighted, where work of any kind cannot be done to the best advantage, and which are choked by the fumes of tobacco and sink drains, and the odors and smoke of cooking. Many an overworked woman into whose life few bright leisure hours ever come, has thought seriously, deeply, broadly on these subjects, but feels helpless to change anything. She has no time to study, scarcely to converse with others, and in the attempt to draw her out to take part in some fresher, newer ideas and action, one feels that so long as the daily life is a perpetual struggle for existence, efforts to rouse the mind to other considerations seem unavailing. While speaking of cooking, I cannot forbear quoting a few sentences from an interesting and ably written paper by Mary G. Ware, for the Woman's Education Association, on "Prevention of Crime among Women." "Foul air nauseating the stomach, bad cooking irritating it, insufficient food exhausting it, want of sufficient clothes and fuel chilling the circulation, each or perhaps all together, stimulate the appetite for some kind of intoxicating drink." "Another efficient influence would be schools where women could be taught to cook in such a way that the family table should be a comfort and satisfaction. The dissatisfaction of the stomach which follows the eating of badly cooked food produces a desire for intoxicating drinks, so that the good cook promotes not only health, but morality." "The opening of diet kitchens in several cities is a movement in the right direction," where regulated so as not to encourage idleness and pauperism, "for the prevention of intemperance by the suppression of its causes." With the brain clogged by foul blood because the lungs are clogged by foul air, how can we expect high or even intelligent moral action? How much do the higher classes do to prevent, how much to encourage these evils? It has been said that it is easy to be a good Christian for one who has a sound spine and a sound stomach, so it is easier for one with bodily wants well supplied to resist the temptations of liquor and to refrain from crime.

In addition to cooking schools there is needed instruction on the importance of well ventilated and clean houses, and especially among

the poorer classes, of the necessity for the removal of all *effete* matters, and of the need of a good blood and bone making diet, in place of the half starving diet of bread and tea, which unfortunately has made its way among our working classes of all sorts, but especially of sewing women, as the popular diet. It is not wholly, if at all, a question of means to obtain better food, for tea is not cheap, but to the ignorance of cooking and of what is suitable and wholesome for them.

A cause of ill health among the women who work in mills, beside those included in what has already been said, are injuries to the digestion and to the nerves, by the habit of tobacco "dipping," not confined to the south, but practiced considerably in this State; these women also suffer from overheated air, whether dry or laden with moisture; and in cotton mills, dust from the carding process, (less since the modern improvements than a few years ago.) Among shop girls there is confinement in over-crowded, badly ventilated shops, deficient sunlight and outdoor exercise, air exhausted by gas and heated over repeatedly, too much standing, infrequent and irregular meals. After standing several hours, exhausted and needing good food, they are allowed often so short an interval at mid-day, that there is not time to go to their cheap boarding place or home, and are too poorly paid to afford a meal at a restaurant, they too soon learn what affords the most stimulus for the least money. Said an older shop girl to one recently from the country, "Don't waste your money on pie, get a glass of gin, its cheaper." Those who do not reach this degradation, yet take inordinately of tea or patent tonic medicines. "If the temperament be nervous and the work mental, there is much more danger from the use of stimulants than when the avocations are manual."\* "As a rule, people are under-fed. This is especially true of women. The tone of the system is thus lowered and local congestions of different parts of the body are produced."† Diseases of the digestive organs, consumption and uterine irregularities prevail with this class of women.

The wealthier classes do not escape disease because of not being obliged to work. "In a discourse upon the consequences of employments, the case of the unemployed has really no place; yet this negative condition of doing nothing has its consequences, and very serious ones too, in connection with the health of its possessors. The lack of definite occupation, or of occupation satisfying the mind and conscience, and which is fraught with blessing, is especially the misfortune of

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\* Rachel B. Gleason, M. D.

† Wm. A. Hammond, M. D.

women, more particularly so in the case of unmarried women, in so called 'easy circumstances.' Among them may be seen the sad consequences of a purposeless, useless, selfish existence. What a lamentable array of disorders is their lot!—a group of nervous ailments, largely associated with the ill-defined and ill-understood condition called hysteria. "It is a praiseworthy feature of the present day that great endeavors are made to find employments for women, to enlarge the bounds of pursuits calculated to arouse their interest, and to foster physical exertion."\* "In young women without useful occupation, the moral nature becomes perverted in addition to derangement of bodily health; the mother's sympathies too often only foster the morbid proclivities by insisting on the delicacy of constitution, and the necessity of various artificial methods for restoration. Such a girl is not the victim of high pressure or mental strain in her own person, but she may inherit a susceptible brain from an over-worked parent. The remedy is work, not rest, occupation, not idleness—a luxurious life is her curse. Insanity as well as hysteria is developed by such a mode of existence. Life must have an aim, although to achieve it there ought not to be prolonged worry.."† "Skilled industry of the hands makes the brain more orderly in action. The child taught to use the hands skillfully is more apt to become an industrious citizen, and the habit of industry is the basis of orderly life."‡

Of causes directly affecting mental health, in addition to those already mentioned, among the working classes, there is worry from small wages, and intensity of anxiety night and day, causing sleeplessness; this also extends to all classes of women, the married from never having any sum or purse of her own, and consequently the utter misery that cannot be conveyed to the comprehension of the other sex; the ingenuity to make ends meet, the contrivances to avoid asking, especially when the need of economy is pressing upon them, even when the husband is generous and kind, all these, where the strain has been long-continued, the same set of ideas maintained in exhausting recurrence, the same part of the brain is kept continuously at work and a weakness results which may end in insanity.

It is said that insanity is on the increase, especially among the ignorant classes, and that only ten per cent. are cured. If this be correct, it is necessary that its causes should be searched for, and something done for its prevention. It is not an exclusively nervous disease, but

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\* Address of Dr. J. T. Arlidge, before the British Medical Association, 1878.

† "Insanity and its Prevention," D. H. Tuke.

‡ Mary G. Ware.

may and does originate in deterioration of the body through intemperance, dissipation in all its forms, over-work, mental and physical, meagre fare, lack of ventilation and neglect of moral culture. All these factors apply to both sexes, but bear more severely upon women, who have, in addition to their greater nervous susceptibility, the care and anxiety of children, menstrual irregularities, miscarriages and the consequent diseases of the pelvic organs. Absence of rational employment of the mental powers leads to indulgence in vices, drinking, &c., especially favorable to insanity in addition to the inheritance from parents who indulged in like habits, for "by free indulgence in stimulants and in tobacco, the parents debilitate their own constitutions, and transmit feeble ones to their children."\* A superintendent of one of our New England hospitals for the insane has said that, "the dissemination of more correct views of the true way of living and a more rigid observance of the laws of health and nature, would greatly diminish insanity." The Commissioners in Lunacy in Scotland in a recent report said, "that insanity is to a large extent a preventable malady, that it is always attended with some bodily defect or disorder of which it may be regarded as one of the expressions or symptoms; preventable diseases will be diminished in amount when education is so conducted as to render the people both intelligent and dutiful guardians of their own physical, intellectual and moral health." "A study of the relation between modern life and insanity, shows that it is of a many-sided and complex character, that a large amount is preventable, that beer and gin, mal-nutrition, a dreary monotony of toil, muscular exhaustion, domestic distress, misery, poverty and anxiety, account largely, not only for the number of the poor who become insane in adult life, but who from hereditary predisposition are born weak-minded or actually idiotic."† "Insanity in women rarely takes place without the concurrence of both physical and moral causes."‡ Physicians have known for a long time that much insanity results from ignorance of the laws of life and health, or a disregard of them, and that it might be prevented by an avoidance of such habits as exhaust nervous power, but the community in general do not know this, and should be instructed. It is also well known to physicians that there are abnormal mental changes in women suffering from various diseases peculiar to their sex; and chief among the causes of these should be placed, forced abortions.

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\* Take.

† Take.

‡ "Insanity in Women." Dr. H. R. Storer.



To the increase of this evil, attention was called by Dr. D. H. Storer, in 1855, then Professor of Obstetrics at Harvard, in his public address introductory to the annual lectures. In 1857, the American Medical Association appointed a committee to report upon criminal abortion with a view to its general suppression, with Dr. H. R. Storer as its chairman; and in the volume of its Transactions for 1859, will be found a series of resolutions by which the Association present the subject to the attention of the several legislative bodies of the Union, desiring that the laws on this subject may be revised. In 1860, Dr. H. R. Storer, published a volume entitled "Criminal Abortion in America," in which he set forth the evils resulting, its increase in this country more than abroad, and the weakness of the laws in those States in which any existed. At that time Rhode Island had no statute, and here, as in some other States, in the absence of special statute, the crime could only be reached at common law, and this only if the death of the woman occurred; no thought being taken for the death of the child, or of the ill health of the woman for the remainder of her life. Thus, in States where a definite statute does exist, it is practically useless and is often avoided, because legislators and the public fail to recognize the true character of the crime. As, for instance, here in Rhode Island, the statute passed in 1872 takes no cognizance of the murder of the child, and if the mother die in consequence of the drugs given or local injuries, done to her, the penalty is imprisonment for a term varying from five to twenty years. "How inconsistent to punish murder, attempted or committed, if by injury to the throat or heart, capitally, and if by injury to the womb, by temporary imprisonment; especially where this latter case always necessitates the slaughter of a second human victim."\* The Rhode Island statute says: "or shall aid, assist or counsel any person so intending to procure a miscarriage," shall incur the same penalties. Could not these words be carried forcibly into every household? Not a day passes but they would apply to some one. The ignorance as regards the guilt and the low morale of the community on this subject, are so perfectly appalling that the boasting of repeated and successful accomplishment passes unreprieved; and the press, such a power in the land, that if it chose, it alone could almost annihilate the crime, apparently openly encourages it, by the advertisements of quack doctors, of medicines and even of so called private hospitals, where the secrets of the victims may be buried with their mortal remains. In 1866, Dr. Storer wrote an essay entitled "Why Not?" to which the American Medical Asso-

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\* "Criminal Abortion in America." Storer.

ciation awarded a prize with an order for its general circulation. This book should be read by every woman and man. Aside from all which a law, however wise or however strictly enforced could reach, are the cases which occur in private, cases known only to the woman herself, through ignorance of the laws of life and health, ignorance of her own anatomy, of her duties to herself, her child, the community and to her Maker.

An erroneous idea prevails, that in the early months of pregnancy, there is no sin, and little danger to the woman's life. This is the very reverse of the truth: for the earlier in pregnancy its occurrence, as a general rule, the greater is the danger to life or to subsequent health, the greater the physical shock, the liability to hemorrhage, the liability to subsequent uterine disease, even to the much dreaded cancer, the active symptoms of which may be delayed until the climacteric,—the liability to repetition from habit or the production of sterility, bringing often disappointment when afterward children are desired. Those who do not look deeply into these causes and effects, say that women are less fruitful now than formerly, and wonder why it is so? The answer is, because they will not let themselves be so. But women are not alone to be blamed for this crying sin of the day; they have also to bear a mental suffering from the discontent of the father, far more acute than that from the fear of, or care for the personal pain and discomfort, often amounting to the temporary insanity of despair, and, therefore, driven as it were, to abortion as the only relief, and often encouraged thereto. Interference with the laws of nature is always productive of disease, and this sin is confined to no class of persons; it prevails among the married and educated, even more than among the ignorant, the poor, the unmarried. The latter might be supposed to have an excuse, if an excuse for a crime could ever be offered. The same argument applies here as was used by Dr. Gerrish,\* in speaking of the social evil, "the chief of these causes is ignorance, \* \* \* that while a lack of ordinary information and learning is conducive to depravity, it is ignorance of the laws of our being which is chiefly responsible for the mischief; that the proper and competent teaching of physiology and hygiene to the young would result in such improvement of morals that, in time, prostitution would largely disappear for want of support and patronage. The limited number of occupations to which women are admitted, their less pay than men for equal work, the obstacles thrown in the way of their learning those kinds of business most desirable for them—these stand as deep and shameful blots on our social

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\* Prof. Mat. Med. Bowdoin. Address before Maine Med. Ass'n, Oct. 1878.

system. As the first step in the right direction, we should have the study of human physiology and hygiene taught in our schools." To this public instruction of physiology, objection has been made that it should be left to the private judgment or tact of individual parents, and to this I reply that, it cannot be so left, for the parents themselves are too ignorant, as I have seen in several instances, and also the terrible results of such ignorance, but the parents should be able to teach their children early in life, the wisdom of subjugating appetites to morality and to cultivate a regard for the rights of others.

That so many women should have no definite occupation throughout the best years of their lives, no aim or purpose, their faculties and talents unexercised or lost, are evils which are fruitful causes of unhappiness and ill health, the effect of which is to be seen in society and is not felt by women alone. "Statistics show that the evil diminishes as means of employment are open to women, and in those cities where most employments are open to them, the lowest proportion of those who lead an abandoned life is found. Every endeavor which is made to open new fields of labor to women is a direct blow at this social evil."\* The moral elevation of women of the lower classes implies and involves that of the men also; they must rise or fall together. Girls should be taught useful industry and skilled handiwork to save them from ill health, sin and crime; to prevent them from becoming a burden to themselves, their parents, husbands, and at last upon the charities of the community and the State. Another cause of this social evil is strong drink, in both sexes—stimulants appear to be necessary to keep up the strength for the life of excitement. The prohibitory law of Maine closed many houses of prostitution—this should give a clew to the management of this evil. They could not keep up this life under that law, and therefore many were driven from the State, and for some years past, in my efforts to work among them, I had observed, before I found the cause, that many came from Maine.

As to the causes of the diseases peculiar to women, the immediate and direct are to be sought in each case, the predisposing causes which are avoidable and are incurred chiefly from ignorance and a disregard of the laws of health are thus enumerated by one of the latest authorities :†

"Neglect of out door exercise,

"Excessive development of the nervous system,

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\* Paper read before the Association for the Advancement of Women, 1874, by Ellen Mitchell, Chicago.

† Dr. T. G. Thomas, of N. Y.

- "Improprieties of dress,
- "Imprudence during menstruation,
- "Imprudence after parturition,
- "Prevention of conception,
- "Induction of abortion,
- "Marriage with existing uterine disease."

To these might be added, Marriage with existing disease in the other sex. This list serves as a recapitulation of the chief topics of this paper. "No one will doubt the conclusion, that if in cold weather the feet, legs and abdomen of civilized women were clad in some woolen material; if they understood the necessity of caution during the period of menstruation and after labor; if they allowed the uterus to hold its proper place in the pelvis, uninterfered with by pressure; if they kept the sanguineous and nervous systems in their normal state of vigor by exercise, fresh air and plenty of good food, and at the same time avoided any habits which directly produce disease by injuring the genital organs, (including the breasts) much, very much less of uterine and kindred disorders would be seen by the physician. All these reforms would probably bring forth results in one generation, but it would require many generations of reformers to restore woman to her proper physical sphere."\* Before much result can be obtained in the physical improvement of women, a change of tone in public opinion is needed. Delicacy must not be confounded with refinement, or thinness and paleness admired for beauty, rather than a comely shape well rounded by the full development of muscle and a due proportion of fat. Sickness should be considered as allied to sin,—the sin of breaking the divine laws of nature; a person should be as much ashamed of avoidable sickness as of falsehood and stealing. When women can be made to appreciate these things and to believe that whatever interferes with the full and proper exercise of any function, is likely to produce irregularity in its performance and finally organic disease, then will they cease to be invalids and sufferers. "If we compare the present state of women in refined society over the world, with that of the working peasants of the same latitudes, or with the North American squaws, or the powerful negresses of the southern States, we can with difficulty believe that they all sprung from the same parent stem, and originally possessed the same physical capacities. Observation proves that women who are not exposed to depreciating influences can compete in strength and endurance with the men

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\* Thomas.

of their races, and in savage countries they are sometimes regarded as superior to them."\*

Knowledge of the causes of disease ought to help in the prevention, but does it? And why does it not, but because ignorance and selfishness rule both men and women, and women have in the past, been taught that they must do nothing to help themselves. Now that they have begun to realize that the regeneration of the world must come through them, they are aroused to form various clubs and associations for study and for practical efforts in all questions affecting the moral and physical condition of women, the effects of which will be seen clearly in the next generation.

I have here expressed my belief that *ignorance* is the first chief cause, at the foundation of all causes, and that therefore the responsibility should be taken up earnestly by those who have charge of public education and public health. It also concerns legislators who have to deal with questions of laws for crimes, to which ill health leads in either sex, to look more deeply into the preventable causes. My work will not have been ill done if any word herein shall elicit food for thought and action by and for women, for the improvement of the physical condition of the race.

A. E. TYNG.

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\* Thomas.

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WHAT IS THE DIETÈTIC VALUE  
OF  
WINE, BEER, AND OTHER ALCOHOLIC BEVERAGES?

BY  
L. F. C. GARVIN, M. D.,  
OF LINCOLN.

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Substantially as read before the Rhode Island Medical Society,  
in December, 1870.

## BEER, WINE, ETC., AS TABLE DRINKS.

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The following article is not designed to treat of drunkenness, which, whether habitual or occasional, receives, even in this skeptical age, universal condemnation.

Nor does it aim to deal extendedly with ordinary dram drinking, in which at least two wineglassfuls of ardent spirits, five of sherry or port wine, or a pint and a half of strong beer or ale, are imbibed in the course of a day. Inasmuch as those who follow drinking to this extent are able usually to attend regularly to business, and are never seen "the worse for liquor," it is quite likely that persons may be found among the ill-informed, especially if their judgments are biased by personal indulgence, who defend the practice. Concerning this phase of drinking it need only be said that nearly all scientists, writers, and physicians, who by experiment or observation have qualified themselves to express an opinion, unite in pronouncing it unqualifiedly hurtful. Every medical practitioner is aware that the men who compose this great class, not bearing acute diseases well, swell the mortality of fevers and inflammations to undue proportions; he knows, too, how these persons, whose blood is scarcely ever free from alcohol, become the victims of chronic disorders, which long afflict them with gnawing and growing discomforts, succeeded by months or years of the most intense suffering, and, finally, bring life to a close when it should be in the prime.

To portray the effect upon the individual of so-called moderate drinking would require more time and space than has been allotted me. The best popular treatise upon the subject with which I am acquainted, and one well deserving a place in the education of our children, is by Dr. B. W. Richardson, entitled, "The Temperance Lesson Book."



My task, here, is to consider the question—upon which medical and scientific opinion is still divided—whether alcohol, when taken in the most unexceptionable manner, is serviceable in the maintenance of health. In other words,

#### IS ALCOHOL FOOD?

In defining the term food, we pass over the technical definitions which abound, and present one wholly practical. Food may properly be vended in the open market; whilst potent drugs should be dispensed by a competent apothecary under the direction of an educated physician.

It is scarcely necessary to show that alcohol is not a *necessary* article of diet. It is not present in the ovum, the sole nutriment of the embryonic state; nor in milk, the only support of infancy. It cannot be found in the animal or vegetable productions, pointed out by nature as the sustenance of adult life.

The elements of all these natural aliments correspond almost precisely with the proximate principles of the blood and tissues. Thus, in milk, a sample of the essential foods, exists water, chloride of sodium and potassium; phosphates of soda, potassa, magnesia and lime; iron; saccharine, oleaginous, and nitrogenous compounds, but no alcohol.

Following the lead of Liebig, many physiologists class alcohol with the hydrocarbons. His theory, that starch, sugar, oil and alcohol, act as “respiratory food,” has been overthrown; but, since it is certain that the three former articles do have some use in the system, a like value is ascribed to the latter.

The argument is, that alcohol and sugar, for instance, are nearly allied, because chemically they are composed of hydrogen and carbon, and by the simple process of fermentation, the one is derived from the other—only the volatile son of a sweet mother! Why, then, it is asked, may not both subserve the same ends in the system?

The resemblance is apparent rather than real. Glucose, by giving off carbonic acid and water, becomes wine alcohol, an easy transformation, it is true, but a step towards destruction. The process is precisely analogous to the decomposition of animal tissue. The carrion in the field bears the same relation to beef in the market that alcohol does to sugar. Yet while the one tempts the appetite in the form of Porter house steak; the other, introduced into the blood, gives rise to most fatal disease. Lineal descendants do not always reflect credit upon

their progenitors, as may be witnessed elsewhere than in the above examples of putrefaction.

Compare, likewise, their physiological action. Sugar is digested in the intestine, and thence slowly absorbed; alcohol passes immediately from the stomach into the veins. The one never reaches the arterial circulation; the other is found for hours afterwards wherever the blood courses, most and longest in the brain, the abode of manhood. The one, never in health, appears in the excretions: the elimination of the other at once begins by lungs, kidneys, bowels and skin. The one, taken in large quantity, satiates; against the other, the system never rebels, till it has paralyzed the power of deglutition. The one, in excess, merely disorders the alimentary canal; the other, by dethroning the reason, transforms man into a brute.

Certain recent writers have evidently perceived the difficulty of including alcohol among the hydrocarbons. Anstie, who has treated the question most extensively, creates a special class of foods, including alcohol, tea, coffee, cocoa, tobacco, &c. Without attempting to explain their *modus operandi*, he claims that they are capable of "averting death from inanition," and are therefore true aliments. If he stopped with this definition and classification, it might be granted. Theoretically, it is true that these articles, as well as the rest of his list, viz.: Chloroform, the Ethers, Strychnia, Morphia, Hyoscyamia, Atropia, Datura, &c., &c., are, under certain circumstances, maintainers of life.

Alcohol, without doubt, is no less a food than Strychnia or Atropia. But while he fails to recommend the trusting of the above deadly poisons to self-prescription by the people, he does, illogically, as it seems, assign a place to alcohol in ordinary diet. Not to dwell upon the inconsistency, we would consider the various arguments which he presents in favor of its use at the table.

First, alcoholic liquids are said to promote digestion. The action in the stomach is to coagulate any albumen present, and by local stimulation to cause a redness of the mucous membrane, and to increase the flow of gastric juice.

That is true. Is it desirable? Certainly, if one's digestion is perfect, any adventitious aid is superfluous, and had better be held in reserve for a time of need.

But suppose a man begins to realize that he has a stomach, and perceives, occasionally, after dinner, water brash, or a heaviness at the epigastrium, is it a matter of course that a "little wine for the stomach's sake" is demanded? A philosopher would seek the cause;

he might omit this piece of pie, or that dish of sauce, practice more thorough mastication, or accord a longer period of rest after eating. In a word, he would strike at the root of the disordered function.

Usually, in incipient dyspepsia, the removal of the cause is all that is required. But suppose a case be found in which the organ has not the power to prepare the requisite amount of food for assimilation, it does not follow that alcohol is the only or the best remedy. Perhaps it is bismuth, or strychnia, or pepsine, or gentian, or rhubarb that is indicated. These are the very cases which require the judgment of an educated physician. They are removed from the bounds of ordinary health; have become disease.

Again, says Anstie, alcohol is intended for those "ailments which are engendered of the necessary every day evils of civilized life."

Where one preaches that doctrine, thousands practice it. After the manner of a cigar, it produces a feeling of general comfort. Little aches disappear. The roughnesses of the journey of life are smoothed out. A physician, if kept awake all night by professional duty, is to make up the loss in the morning, as far as may be, by a few drachms of brandy. If the approach of an important operation produces in the surgeon a disagreeable feeling of trepidation, he is to steady his heart and nerves by an ounce of whiskey. If the hour of sleep finds him tossing on his bed with anxiety, a glass of wine will invite "nature's sweet restorer." If tired, or cold, or aching, or sleepy, or wakeful, or if in any way the nerves recoil under abuse, drink. Nay, more, since every day has its trials, it is well to accompany each meal with a glass of sherry or champagne, that duty may be made easy in advance. Such, we understand, is the argument in favor of alcohol, as a nervous stimulant in ordinary health. One might suppose that the moderate drinker would be free from all discomfort, superior to every infirmity of the flesh.

Theories are always beautiful until reduced to practice. They may be so perfect as to be irrefutable, except by the logic of experience. We will not, therefore, attempt an elaborate rejoinder to this one, but leave it to the observation of any rational man, whether a panacea has yet been discovered for all the ills to which "humanity is heir."

The power of alcohol to defer inanition, is made use of to prove its value as an article of diet. That it possesses this property is indisputable. Physiological chemistry has substantiated nothing more certainly than that small as well as large doses of alcohol diminish tissue change. Every product of the destructive metamorphosis of the system is decreased in amount by the ingestion of any alcoholic prepara-

tion. Less carbonic acid is thrown off by the lungs, less solid matter in the fæces, less urea, uric acid, and phosphates by the kidneys; the temperature of the body, that most accurate measure of vital activity, is reduced. Such prevention of waste necessarily postpones starvation. In shipwreck, a cask of brandy would doubtless protract life longer than the same quantity of water.

But how many in this country are unable to get enough to eat? The greater danger is of gormandizing. In those persons who have enough wholesome food, it is undesirable to lessen the moulting of the organism. Tissue change is a measure of vitality; vitality is a token of health. In a state of debility, the solid excreta of the system are diminished. In sleep, the temperature is half a degree lower than when awake. Is it, then, advisable to imbibe that which reduces the physical condition of daily life to the level of invalidism or torpidity?

On the other hand, the solid excreta of the robust and active man is greater than in the sedentary. Exercise or digestion raises the temperature, and augments the excretion of carbonic acid.

Here, then, an agent is recommended which prevents, to a greater or less degree, the normal manifestations of exalted animal life.

Water, on the contrary, like a true handmaid of nature, promotes the healthy metamorphosis of tissue—prevents, as it were, the clogging of the wheels within the complex machinery of the human body.

Whilst admitting that “alcohol adds no increment to the bulk of the tissues,” Anstie yet relates numerous cases, occurring in the practice of various English physicians, to prove that life has been maintained for a long period chiefly, or even wholly, upon spirituous beverages.

Not one of the very remarkable instances is perfectly substantiated; but he thinks there must be some truth in so much evidence. Perhaps the most wonderful example was a patient of Dr. Inman: “She was about twenty-five years of age, handsome, florid and embonpoint; of very active habits, yet withal of a delicate constitution.” “This lady had two large and healthy children in succession, whom she successfully nursed. On each occasion she became much exhausted, the appetite wholly failed, and she was compelled to live solely on bitter ale and brandy and water. On this regimen she kept up her good looks, her activity, and her nursing, and went on in this way for about twelve months.”

It is evident, as these physicians claim, that the moderate checking of destructive metamorphosis effected by alcohol, would not suffice to explain cases like this. It must be a direct nutriment. Indeed, if

these be facts, it is far superior, as a food, to all the hydrocarbons. Lehman undertook to live exclusively upon a diet of starch, sugar and oil. He became, in consequence, so ill, that at the end of three days he abandoned the experiment. Hammond made himself absolutely sick by ten days dieting upon starch and water. Such a result is not surprising, when we consider that five ounces of nitrogenous matter are excreted daily, and that consequently, at least a like quantity must be ingested, if the tissues remain intact. A non-nitrogenous diet, like alcohol or starch, by *a priori* reasoning, would be insufficient to maintain life. But if there is a substratum of truth in these extraordinary cases, and unless they be the kind of exceptions that do but prove the rule, it is an easy matter to put them to the test. Let Doctor Inman institute an experiment as to how long he himself can live solely upon alcoholic beverages. Only such proof will be convincing, for we are assured that the patients, whose cases they report, if put under strict surveillance, like the hysterical girl recently starved in England, would either eat or die.

As a proof that the special class now under consideration is alimentary, it is stated that there exists for it in man a natural appetite. That although there are individuals who abstain entirely from every form of stimulant, yet throughout the globe there is a general use of alcohol, opium, tea, coffee, tobacco, hasheesh, cocoa, or arsenic. The fact is acknowledged, but this is not the age to assert that all natural tendencies of imperfect humanity are right. On the contrary, the use of these stimulants is no more extensive than depravity. It is the mission of religion and civilization to do away with all manifestations of selfishness, whether of the appetite and passions, or of the heart.

In closing the consideration of alcohol, as belonging to a special class of accessory food, it is well to consider to what an acceptance of this theory logically leads. So far as we can distinguish, every argument in its favor applies to opium as well as to alcohol. If the one is of important dietary value, so is the other. Yet, to judge from the stringent legal regulation of the sale of opiates, and from the care of physicians in their administration, few hold the opinion that the seductive extract of poppy should be thrown open to general use.

The latest work on this theme is by Dr. Calkins, of New York, entitled "Opium, and the Opium Appetite." It probably embodies the opinion of the majority of the profession.

As a collection of facts, it certainly is worthy of all praise. The author arrives at the conclusion that opium eating is worse for men, but rather better for women, than drunkenness. He fears that the

practical effect of the disuse of alcoholic beverages will be to introduce as a substitute the more portable and degrading inebriant, morphia. He bewails the fanaticism that advocates total abstinence from alcohol, but of opium, he says, as a "deduction," in the last chapter of his book "Against the temptation to habitual use, neither individual constitution, nor social condition, provides any certain immunity." "In a practical view, it may be affirmed of the habit, that the same is virtually non-vincible." "Dosing, by gradual augmentations, is the normal course of experience."

These are words that apply to alcohol as well as to opium. If they be true, the cry of total abstinence cannot be pronounced absurd, until experience has shown that such a course is deteriorating to bodily health.

Thus far we have endeavored to show that there is insufficient reason to class alcohol with any sort of food. Now, there remains to be considered, its relation to drugs. In this it is not necessary to select the gentler agents of the *materia medica*, whose action is silent, and whose power for good or evil is scarcely determined. On the contrary, alcoholic liquids will bear comparison with the most potent medicines of pharmacy, such as prussic acid, belladonna and chloroform. Powerful neurotics usually enter the blood directly from the stomach, exert each its peculiar action upon the system, exercising, in an unexplained manner, an especial influence upon the nerves, and then pass out through the emunctories, leaving the body once more subject to normal agencies. Like German invaders on French soil, they bring new customs, overthrow the established order of things for a season, and then depart, leaving temporary disturbance behind, with perhaps an ultimate beneficial result. Now, it cannot be said that the whole of a dose of alcohol, or certain other nervines have been detected in the excretions. But it is true that the physiological action is temporary, and that at the end of a short time (not usually more than forty-eight hours) no trace of them can be discovered in the body. If the doses, however small, are so frequently repeated, that the blood is never free from their presence, an abnormal change is effected in the molecular constitution, either of the nerves or vital organs; also, in excessive doses they produce death. These are attributes which, as no words are required to show, belong to alcohol.

Without pursuing a general comparison further, let us observe more closely the resemblance of alcohol to a single admitted drug.

Ether might well be named Rapid Alcohol. The relationship in this case is genuine. The formula for ether is C. 4, H. 5 O.; for

alcohol C. 4, H. 5 O., H. O. The one is oxyd of ethyle, the other hydrated oxyd of ethyle. The former is obtained from the latter, simply by the subtraction of one equivalent of water. Both are volatile, mobile liquids, of a penetrating odor, both combustible, readily evaporating, quite universally solvent. Their boiling points are low, viz: 95° and 172° F. Neither can be frozen by a temperature of 166° below zero. Both produce their effects when inhaled, as well as when administered internally. Of each, the primary action is stimulant, the secondary, anæsthetic. From the first introduction of etherization, Dr. Bigelow and others have remarked how precisely its different stages correspond to those of alcoholic intoxication. It is the same thing condensed into a shorter time; yet we have never heard it advanced that ether is an article of diet, and should be placed in the hands of the people for indiscriminate use.

Of the many who urge the value of alcohol, as a stimulant in health, we know not one who approves it as a narcotic. Anstie believes that its use in disease, even, should be limited to small doses, and that if the desired effect is not thus obtained, its administration is contra-indicated. Whilst unable to prove that small and large doses differ only in degree, we do assert that their action is not so directly opposite as has been described; but that on the contrary they are strikingly analogous. We know not that the experiments of Dr. Edward Smith have been disproved, from which he concluded that a minute quantity of spirits impairs the perceptive power of the special senses.

The first indications of narcosis, are flushing of the face, moisture of brow, or cerebral excitement, caused by paralysis of sympathetic or cerebral nerves.

But before any of these symptoms appear, a so called proper dose, it is said, produces a sense of warmth, at the epigastrium, and of universal comfort, allays hunger, relieves pain and wakefulness, checks excretion, and, unlike an intoxicating quantity, increases the force and rapidity of the heart's action, necessitates no reaction, calls for no subsequent increase.

It is well known that the first six in the above classification of effects, viz.: the causation of local and general comfort, the lessening of appetite, pain, insomnia, and excretions, are brought about, not only to an equal, but to a *greater* extent by large than small doses. It is a fact illustrated by every drunken spree.

As to the augmentation of the heart's activity, being evidence that stimulant and narcotic doses of neurotics are radically diverse, look at Anstie's own experiments. One drachm of ether raised his pulse from

74 to 88, whilst two and a half drachms (an intoxicating dose for him) carried it to 104 beats per minute. Indeed, all have witnessed in the production of anæsthesia, that pulsation is most rapid during the period of greatest excitement, when consciousness is nearly extinct.

Great stress is laid upon the idea that no reaction whatever follows the use of a mere stimulant. Certainly the recoil from a single glass of wine is seldom disagreeable. That it always, however, exists, we may infer from the fact of its severity in certain cases of idiosyncrasy, and because even the normal stimulation of a meal, or bath, is succeeded by moderate depression.

Lastly, it is asserted, that a purely stimulant use of any of this class, does not deprave the appetite, or lead to increase, either in the quantity or strength of the beverage.

This is another assumption, concerning which we appeal to experience for refutation.

I once advised a man subject to extreme cardiac pain to cease the use of tobacco. He was a habitual, but moderate user, rolling it as a sweet morsel under the tongue, rather than chewing it. The effect was merely a feeling of comfort. He gave it up for two weeks, substituting bark, liquorice, &c., in order that the mouth might feel its accustomed tenant. But the system could not be thus cheated. He was obliged to leave off work as a painter. The tremor of hand and disorder of mind completely unnerved him, nor could the brush be resumed till he had gone back to the tyrannical weed,—as much a victim of slavery as any treated of in “Uncle Tom’s Cabin.”

We are all familiar with the effect of opiates upon children under the guise of Mrs. Winslow’s Soothing Syrup, and other similar preparations. The result is an increase of dose from month to month, and continuous worrying when not under its influence.

It is to be observed, likewise, that those foreigners, resident in our country, who laud the sprightliness and temperance of Europeans, are themselves in love with the wine cup. They import largely for personal use, and feel lost without their habitual stimulus.

It is probable, as has been before stated, that a man can survive upon a less than average amount of food by the help of some of this liquid tissue preserver. But that moderate drinkers in our country take less food than abstainers, we would fain deny. Ales, wines, and whiskey are prescribed for want of appetite. Is it thought to increase the desire for food, and still have the patient eat less?



Those who "linger long at the table" are wine bibbers. It is this adventitious aid which enables them to digest five or six courses of richly served viands.

While bathing at Newport last summer, during the hour allotted to men, an opportunity was afforded for studying the anatomy of some of our moneyed aristocracy. We were surprised to see their stomachs so much larger than their heads. It suggested, in spite of our reverence for America's prominent men, porkers fattened for the market. While achieving their prosperity, they doubtless were not afflicted with hypertrophy of the stomach.

Finally, it is unfortunate for the theory that small doses are wholly beneficial, and large ones utterly detrimental, that Anstie's extraordinary instance of life, maintained by alcohol, with scarcely an exception, occur in downright toppers. The young woman, for example, whose case has been related, was several times on the verge of delirium tremens.

The facts collated in this paper indicate the true use of alcohol. It is a preservative of the tissues, not by supplying what they need, but by checking their waste. Its application, then, is to that emergency, when, from any cause, destruction is in excess of construction. Hence, its value in low forms of fever, when, as indicated by the high temperature and crowded emunctories, disorganization is taking place with dangerous rapidity: also, in those chronic affections in which emaciation is the prominent symptom. Finally, in those special cases, where even the most concentrated forms of food are rejected by the stomach, brandy may be retained, and temporarily suffice. When given under these circumstances, not an atom would we subtract from its fair fame.

Physicians, themselves, when requiring treatment, seek the advice of a brother practitioner. They know that a sick man, however skillful, is unable to judge correctly of his own case. But alcoholic liquors, classed among the most potent drugs of the materia medica, every man, however ignorant, may prescribe for himself. Is it strange that such self-made doctors often kill their patients?

The persons who enter upon the use of stimulants are not those who are afflicted with dyspepsia, whose circulation is sluggish, and who seem to require an extraneous aid to keep even with the duties of daily life. The habit is begun in the vigor of youth, when vitality is superabundant, when mince pie, cheese, and doughnuts can be eaten at bed-time with impunity, when ambition is exuberant, and hope is buoyant. At a period when judgment and experience alone are unde-

veloped, the young man is tempted on every hand to stimulate. The consequences may be read in the poverty and crime of Rhode Island.

We have shown that alcohol is not one of the essential foods; by comparison, that there is little physical or physiological resemblance between it and the hydro-carbon foods; whilst the relation between it and anæsthetic drugs is extremely intimate. That, as a member of a special class of aliments, it is only nutritious in the same sense as opium and arsenic. In fine, theoretically, there is reason why it should be subject to the same restrictions as other potent drugs. Is it not likewise true practically? If the beverages presented for public sale contained but two or three per cent. of alcohol, philanthropy might reserve its forces for greater evils. But the best wines in American market contain from twelve to twenty per cent. of alcohol, and the least hurtful adulteration to be hoped for is the increase of that proportion. Indeed, so soulless are the men who engage in this traffic, that no poison is too dangerous for them to make ready for the stomachs of their fellow men.

In consideration of the scientific facts known to the profession, and the daily effects known to all men, we believe it both a right and a duty to stop the sale of stimulating beverages by irresponsible persons, and to confine them to their proper place in the drug store.



# THE CAUSATION OF TYPHOID FEVER.

BY

GEORGE E. WARING, JR.,

OF NEWPORT, R. I.,

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The Trustees of the Fiske Fund, at the annual meeting of the Rhode Island Medical Society, held in Providence, June 12, 1878, announced that they had awarded a premium of two hundred dollars for the best dissertation on The Causation of Typhoid Fever to an essay bearing the motto, "*Qui n'a santé n'a rien*," and on breaking the seal of the accompanying packet they found the author to be George E. Waring, Jr., of Newport, R. I.

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## THE CAUSATION OF TYPHOID FEVER.

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The long-continued and somewhat thorough investigations of the ultimate methods of the causation of this disease have failed of a scientifically accurate result. The question whether typhoid fever always springs from the presence of specific poison produced by a parent case of the disease, or whether it may, under certain circumstances, arise *de novo*, is still in doubt. It is hardly worth while, in a paper prepared for the use of medical practitioners, to restate the facts and observations which support one or the other of these theories; this would lead only to the inconclusive result which has always thus far attended the discussion.

By far the majority seem to sustain the opinion of Dr. Budd and his followers, that the disease can originate only from the presence of a specific poison produced by a previously existing case. It should be remembered, however, that as most physiological investigators have confined their observations to dense communities, where the disease has prevailed, their observations are more or less clouded by the probability that previous cases have had an influence upon those under consideration.

Although their number is far smaller, other investigators have devoted themselves entirely to very sparsely settled districts, whose isolated families have so little communication with the rest of the world and with each other, that it is easy to determine the exact circumstances of contact. The occurrence of typhoid fever in a house standing miles away from all others, where it is rare that any member of the family goes from home, and where a visitor as rarely comes, furnishes strong presumptive evidence of the correctness of Dr. Murchison's theory of a possible *de novo* origin.

To show the testimony upon which opinions are based, we may cite the instances described in various reports of the Massachusetts State Board of Health. In that State the annual deaths from this disease are about one in one thousand, and it is estimated that one-tenth of the cases are fatal; so that about one per cent. of the population are attacked by the disease. There, as elsewhere, typhoid is peculiarly a disease of the country rather than of the town. The observations of ten years show that among a population of 1,044,294 persons, living in large towns, the typhoid death-rate was 0.755; and that among a population of 213,468 persons, living in small towns, the rate was 1.189.

The case is reported of a house in Hadley, built by a clergyman, where a well existed in the cellar into which foul air from the sink drain had access. Vegetables were kept in the cellar; the windows were never taken out; there was no escape for the foul, damp air; and water stood in drops upon the ceiling and walls.

"After a few months' residence in the house the minister's wife died, of fever, so far as I can learn. He soon married again, and within one year of the death of the first wife the second died, from, as I understand, the same disease. The children were also sick. He lived in the house about two years. The next occupant was a man named B—. His wife was desperately sick. A physician then took the house. He married, and his wife died of the fever. Another physician was the next tenant, and he, within a few months, came near dying of erysipelas. All this while matters had remained as before described with reference to ventilation. A school-teacher then rented the house, and tore up the closed box, but did not cover the well. This was about eight years after building the house. The sickness and fatality were so marked that the property became unsaleable. When last sold every sort of prediction was made with reference to the risks of occupancy, but, by a thorough attention to sanitary conditions, no such risks have been encountered."

The case of the Maplewood school, at Pittsfield, fully and thoroughly reported upon by Drs. Palmer, Ford, and Earle, is too well known to be detailed here. Of seventy-four resident pupils, sixty-six had illness of some sort; fifty-one had well-marked typhoid fever. Of the whole family of one hundred and twelve persons, fifty-six had typhoid fever, and sixteen of these died. The cellar was used for storing vegetables; the privy vault communicated with the main hall of the building; the kitchen drain discharged near by; the privy vaults were filled nearly to the surface; and, in the summer season, the house was pervaded by

foul odors. The school was dismissed; the sanitary condition of the establishment was thoroughly improved, and the institution became and has continued free from disease.

In a boy's school in Pittsfield the well stood under the wash-house, and was fouled by its leaking drain. Coinciding with this condition there was a serious outbreak of typhoid. The well being closed, and the water supply being taken from another source, the fever subsided. In another instance, men engaged in draining a meadow drank from a well supplied only from the water of the meadow, and were attacked under circumstances which seemed to connect the disease with the drinking of this water. In another an attack followed the drinking of water from a sluggish brook fouled by town sewage.

Evidence is given in these reports of outbreaks which were traceable to the tainting of an air-box, which supplied a furnace, by exhalation from the house drain; by the draining of a mill-pond which contained *no* sewage matters; and by the proximity of a stagnant ditch which had no obvious source of excrementitious fouling.

In Sutton an outbreak of typhoid coincided with the flow of barn-yard waste into a well three rods distant on the occasion of a sudden thaw.

The correspondent from the town of Oxford says: "So firm is my belief of this [referring to exhalations from foul drains, cellars, privies, and pig-sties] as a cause of typhoid fever, that when I meet with a case of typhoid fever, not readily traceable to some of these causes, I infer that the truth has not been told me, or that my perceptive faculties have been at fault."

At Martha's Vineyard and in Newton there seems to be evidence that the prevalence of typhoid is effected by geological conditions, clay subsoil or underlying rock covered with rich soil favoring the disease. The very local character of most epidemics indicates defects of soil rather than of air. A physician in Pittsfield reports four cases and one death occurring among charcoal burners occupying two houses standing high up on the mountain side, and supplied with pure spring water. The first case had been exposed to no other than local agencies. The house was built into the hill-side, and on its upper side there was a foul pool of house-slops standing several feet higher than the level of the floor. This seemed to have caused the first attack of the disease, which subsequently extended to the other house, there being frequent communication between the two. The outbreak took place in August, when the windows overlooking this foul water were probably kept open.



At Coltsville, slops were thrown out near the well, and a foul barn-yard pool stood near it. The condition of the well was the only traceable cause of the disease which followed. In another case the fever occurred after the use of water from a well near a barn-yard. Indeed, in all of the records of typhoid investigations, here and abroad, there appear innumerable instances where drinking-water wells were contaminated by infiltrations from manure heaps, swill, slops, cesspools, and privy vaults. In other cases, where there has been no conspicuous contamination of the drinking-water, outbreaks of the disease have coincided with the emptying of mill-ponds for the purpose of repairing the dams. Again, the infection of well-water by the infiltration of soap-suds in which the clothing of fever patients had been washed seems to have caused an outbreak.

One of the most striking examples of investigation of the ætiology of typhoid fever occurring in very sparsely settled districts is to be found in a paper by Dr. W. H. Bramblett, of Newberne, Va., published in the *Virginia Medical Monthly*, May, 1877, page 109. Dr. Bramblett practices along both sides of New River, which flows through a mountainous country broken into numerous valleys and gorges. There are no ponds or marshes whatever, and the elevation is from twenty-two hundred to twenty-five hundred feet above the sea. His investigations lead him to the belief that typhoid fever may originate without the least possible connection with a previous case. He cites seventeen cases, which had seven distinct starting-points, entirely unconnected with one another and with any other traceable source of contagium. The drinking-water seems to have been always pure, mountain-spring water; the privies appear to have been well placed with respect to the house; and, so far as can be gathered from Dr. Bramblett's report, there was an entire absence of all of the conditions which usually attend outbreaks of this disease. The description of symptoms indicates that the cases were all true typhoid fever. Among his conclusions Dr. Bramblett suggests the following: that "typhoid fever often originates spontaneously," or that "the contagium to which the disease owes its specific character originates *de novo*."

In estimating the value of this report it is to be considered that the reporter believes typhoid fever to be directly contagious,—a conclusion diametrically opposed to the recorded observations of those who have had experience in great fever hospitals.

While the voluminous records of investigation as to the origin of typhoid fever fail utterly to decide the question between those who do and those who do not believe that it can originate *de novo*, and while

they leave in doubt the question between "living germ" and "specific poison,"—while, in other words, they leave the purely scientific problem still unsolved,—they are full of instruction as to the causation of the disease as we almost uniformly know it in practice. From the point of view of the medical practitioner, although much is still to be learned, we already know enough for the complete stamping out of typhoid fever as an epidemic. Sporadic cases may still occur, but if the physician knows what he may now learn, if he is energetic in the performance of his duty, and if he is sustained by private opinion and by public authority, he may, in every instance, prevent the extension of the disease to a second subject. Practically, so far as the health of the public is concerned, we may be said to possess already very nearly all the knowledge that we need.

There is no longer any dispute concerning the chief vehicles by which the specific contagium of typhoid fever is conveyed. These are the air that we breathe and the liquids that we drink. Perhaps we may narrow the question still more, and ascribe to the action of the air only the indirect conveyance of the contagium to the stomach; for there are indications that as the contagium of typhoid fever proceeds from disorders of the alimentary canal, so it is only the surfaces of the alimentary canal which are susceptible to its attack.

The poison of the air may be direct or indirect. That is, it may be due to the exhalations of decomposing matters in dung-heaps, pig-sties, privy vaults, cellars, cess-pools, drains, and sewers; or it may be due (according to Pettenkofer) to the development of the poison deep in the ground, and its escape in an active condition in ground exhalations. The water, milk, etc., which we drink may be contaminated by the absorption of foul odors from air with which they are in contact, or by the direct admixture of organic matters bearing the elements of infection. There is such a multitude of possible sources and channels by which the infection may be brought to us that it is often almost impossible, in first cases, to determine which has been actually in operation; but the original case being established, it becomes comparatively easy to trace the channel of its influence in the production of further cases.

It is with these well-known and clearly traceable agencies of development and communication, by which the initial causation is favored and the extension of the disease insured, that the practicing physician and the health officer have chiefly to do. If it is true that prevention is better than cure, then it should be the first care of the physician to insure the absence of all conditions which do or may favor the origin and spread of the disease.

Typhoid fever has in this connection an especial importance, not only as being a wide-spread scourge of almost unequaled magnitude, but as being the typical "pythogenic" disease. Its development and extension are due to conditions which equally promote the spread of diphtheria, diarrhœa, dysentery, cerebro-spinal meningitis, scarlet fever, and the long list of minor ailments which, without destroying life, make living almost worthless,—diseases which undermine happiness, sap the springs of energy, and overwhelm the patient with listlessness and *ennui*. It is the best known and the most widely spread of the long list of preventable diseases; and as the circumstances which favor the extension and aggravate the character of the whole of these are those which have the strongest influence over itself, so by removing the conditions which foster them we shall do much to restrict its contagion.

All the learning of the ages has taught us no better formula to express a perfect sanitary environment than the old one of Hippocrates: "Pure air, pure water, and a pure soil."

If we would turn typhoid from our doors, and literally stamp it out as an epidemic, we need only to insure this condition in its integrity. We may still import single cases from less cleanly neighborhoods, but it will be our fault if we permit it to attack even one of our own community.

Turning now to the practical bearings of the question, we may safely assume that typhoid fever is not conveyed by simple personal contact with the diseased body. According to Dr. Murchison, in the London Fever Hospital, where two thousand five hundred and six cases of typhoid fever were treated in fourteen and one-half years, there occurred during the whole time only eight cases which originated in the hospital. Other instances are almost as striking, and in some cases the disease originated in isolated wards, such as small-pox wards, where personal contact was impossible, but where a conveyance of the infection by drains, air channels, etc., was clearly detected.

It may doubtless be assumed that the agency in the spreading of the disease from an original case exists entirely in the dejections from the bowels. Dr. Budd thinks that the surface of the bowels throws off the specific poison, as the surface of the skin throws off the poison of other diseases. The infecting material, whatever may be its character, is believed never to be active until it has undergone a certain development in connection with subsequent fermentation or decomposition of the dejections. Its vitality is very great, and seems little dependent upon circumstances other than the effect of a very high temperature. Dr. J. M. Lazzell, in the Transactions of the Medical Society of West

Virginia for 1877, publishes a paper on the contagiousness of typhoid fever, in which he describes an outbreak in the family of one Thomas, which in time produced such terror that no nurse or washer-woman could be induced to come to the house. The bed linen and clothing, soiled with typhoid dejections, were boxed up and packed away. Three months after the disease had disappeared from the country, and when the general health was good, a girl came from six miles distant to do the house-work. Among other things she washed this boxed-up clothing. In ten or twelve days she was taken sick, and went home. Dr. Lazzell was called to her five days later, and recognized the same form of typhoid fever that had occurred in the Thomas family. Eleven members of her household were exposed, and eight of them took the disease. It did not attack a single person not so exposed.

The evidence is copious and conclusive that typhoid infection is transmitted often to a long distance, and after the lapse of considerable time, by running water to which the dejections have obtained access.

In Wicken Bonant the stools of a typhoid patient were thrown into a vault which stood near to the edge of a brook thirty-five yards above the parish well. The water-course carried the infection to the well. Forty-five cases occurred: five of them among one hundred and eighteen persons who did not drink the water from the well, and the remaining forty among eighty-eight persons who had no other source of water supply. That is to say, of those who used the water from the parish well forty-six per cent. were attacked, and among those obtaining water from other sources less than three per cent. were attacked. This statement is taken from the twelfth report of the medical officer of the privy council of England.

I have previously cited the case of the outbreak at Over Darwen, in England, as follows:

“There has recently been an investigation into the origin of an outbreak of ‘filth fever’ in Over Darwen, England, the origin of which for a long time eluded the careful search of the authorities. It was finally worked out by a sanitary officer sent from London. The first case was an imported one, occurring in a house at a considerable distance from the town. The patient had contracted the disease, came home and died with it. On first inquiry it was stated that the town derived its water supply from a distance, and that the water was brought by covered channels, and could not possibly have been polluted by the excreta from this case. Further examination showed that the drain of the closet into which the excreta of this patient were passed emptied itself through channels used for the irrigation of a neighboring field.

The water-main of the town passed through this field, and, although special precautions had been taken to prevent any infiltration of sewage into the main, it was found that the concrete had sprung a leak and allowed the contents of the drain to be sucked freely into the water-pipe. The poison was regularly thrown down the drain, and as regularly passed into the water-main of the town. This outbreak had a ferocity that attracted universal attention; within a very short period two thousand and thirty-five people were attacked, and one hundred and four died."

Liebermeister says that typhoid dejections, conveyed in night-soil spread as manure upon the gathering ground of an aqueduct, so contaminated the water supply as to produce an epidemic of typhoid fever among the population using the water.

Similar instances might be cited almost without number. Indeed, there is among investigators no difference of opinion as to the communication of the disease by means of drinking-water thus polluted. There are many instances recorded of the contamination of the water of wells by the transmission of fecal matters through the soil from adjacent privy vaults and cess-pools. One of the most striking of these is that of an outbreak in the village of New Boston, in Erie County, N. Y., in 1843, investigated and reported upon by Dr. Austin Flint, Sr. From its early date this case is worthy of description here. No case of typhoid fever had ever been known in the county. The community numbered forty-three persons; twenty-eight of these were attacked with fever, and ten died. All of those affected obtained their drinking-water from a well adjoining the tavern; but one family, living in the midst of the infected neighborhood, owing to a feud with the tavern-keeper, did not drink this water, and escaped infection. Two families lived too far away to use this well. This immunity on the part of the enemy of the tavern-keeper led to a charge that he had maliciously poisoned the well,—a charge which resulted in a suit for slander and the payment of one hundred dollar damages. At that time the idea that typhoid fever might be communicated by infected drinking-water had not been advanced; but its truth receives strong confirmation from the fact that a passenger, coming from a town in Massachusetts, where typhoid prevailed, and traveling westward in a stage-coach, having been taken ill, was obliged to stop at this tavern. Twenty-eight days after his arrival he died of typhoid fever, and thus, doubtless, transmitted in some way to the water of this well the germs of the disease, which speedily attacked every family in the town except the three which did not resort to it for their supply.

Not only does water itself serve as the direct vehicle of contagion, but it has in several striking instances, caused the serious contamination of milk which had been directly diluted by it, or which had been stored or carried in vessels washed with it. The most noteworthy of the reported cases of this character is that of an outbreak in Marylebone and the adjoining parts of London, reported by Radcliffe in the second number of the new series of reports of the medical officer of the privy council. Two hundred and forty-four cases were distributed through one hundred and forty-three households. There was at that time no corresponding increase in neighboring districts, and the metropolis generally was unusually free from typhoid. The conclusions arrived at were the following: (1) the outbreak was caused by milk infected with enteric fever material; (2) this milk came from a particular farm; (3) the water used for dairy purposes on this farm contained excremental matters from a patient suffering from enteric fever immediately before and at the time of the outbreak. Of one hundred and ninety-one cases occurring in nine weeks, one hundred and sixty-seven were in households taking this milk, and only twenty-four in households not taking it.

All evidence points to the long vitality of the infecting material, which lies dormant at times for many months, and then, under favorable circumstances, acts with violence.

Not only does the infection follow the course of water to which it has gained access, or find its means of dissemination in the exhalations of decomposing filth, and thus contaminate the air which we breathe, but these exhalations are readily absorbed by water, which is capable of holding the poison, to the detriment of those who may drink it, and of transmitting it again to air with which it may be in contact. Many cases have been reported similar to that cited by Dr. Carpenter, health officer of Croydon, who traced the origin of an outbreak to the drinking of water from a house cistern, to which air from the public sewer had been led by the pipe serving as an overflow for the cistern.

Especial danger attaches to the use of water-traps, or water held in the bends of waste-pipes, soil-pipes, etc., when these are the only barrier between the interior of the house and a sewer or cess-pool containing typhoid dejections. The retained water absorbs the poison at its outer or sewer end, becomes saturated with it, and gives it off to the air in the house end of the pipe.

The conclusion from the foregoing is clearly this: that the dejections of typhoid patients are always to be regarded as dangerous material, capable of developing and spreading the fatal infection under a great

variety of conditions; that the only sure means for preventing the spread of the disease must be sought either in the speedy, complete, and distant removal of the material, or in its complete disinfection. If to be retained in the vicinity of human habitations, it must be disinfected, or subjected to decomposition, under such conditions that its poisonous material shall be destroyed; if to be removed, it must be removed to a point beyond the reach of the community, and to a point where it can in no wise contaminate the source from which drinking-water is taken.

The contagium of typhoid fever is not a poison in the sense in which strychnine and arsenic are poisons,—attacking alike each body into which it may be introduced,—but, like the contagium of other diseases of its class, it depends upon a certain condition of susceptibility on the part of the subject. This infection, like many others, is inoperative except upon a system prepared to receive it. In other words, we must have not only the seed but also the soil. In discussing the causation of this disease with the practical object of seeking the means for its prevention, we have to regard not only the source of the contagium, the vehicles of its transmission, and the method of its attack, but in almost equal degree those influences which tend to dispose the human body to succumb. This double condition (that there must be, if not absolutely always, at least very generally, an actual element of contagion, whether germ or specific poison, and also that there must be a state of susceptibility on the part of the subject) greatly improves our chances of success in contending with the disease. We know where the morbid material resides, and so are enabled to avert its approach; and, on the other hand, we know what conditions of living induce the susceptibility, and so have it in our hands, by improving these conditions, to increase the power of resistance.

So far as the prevention of typhoid fever is concerned, aside from tonic medication, the means to be employed are of a purely hygienic character; it is a question of the skill of the practitioner as a sanitarian rather than as a physician. He has two objects to attain; first, the removal of the infecting cause; second, the provision of healthful conditions of living. If the theory is correct that, as Dr. Murchison supposes, typhoid fever may originate *de novo* from the decomposition of organic matter, then the two objects are to a certain extent blended, in so far as atmospheric conditions, which might induce susceptibility, are also capable of causing the disease. In effect, our practice will be safely guided if we regard the two objects as separate and distinct.

Starting with the proposition that typhoid fever is produced only by

the operation of a specific cause borne in the dejections of typhoid patients; that it is innocuous when first voided, but becomes active after a certain exposure in the decomposing fæces; that it has great vitality; that it is capable of being carried by flowing water, by water percolating through the earth, and by the vapor of water floating in the air; that it may be absorbed and retained and exhaled by water; and that it may be retained, developed, and transported by clothing and other articles soiled by its medium, we see that the greatest possible vigilance and the most skillful care are to be applied to the treatment of typhoid dejections. Some of the experiences of England indicate the truth of the statement of the Rivers Pollution Commissioners, that so far as the cause of infection is concerned "filters do not filter and disinfectants do not disinfect." It will at least be safe to assume that in the case of water-carriage the immediate distant removal and the most complete atmospheric exposure are much more effective than any treatment of sewage by the usual methods of filtration; also, that any attempt at chemical disinfection must be more than ordinarily thorough. There is reason to suppose—reason almost sufficient to secure reliability—that the poisonous element is developed and made effective only when the decomposition of the fæces containing it takes place in the absence of a supply of fresh air sufficient to carry it on in the most rapid and healthy way. In other words, active oxidation, whether produced by oxidizing disinfectants, by the operation of atmospheric oxygen, or by the intensified oxidizing power of the contained gases of porous material, seems to prevent decomposing fæces from assuming a condition favorable to the development of infection. The evidence in support of this theory is of course of a negative character, but it is extensive, and, so far as the writer knows, it is accepted by leading physiologists.

Typhoid fever is not produced by exhalations from the surface of lands irrigated with the discharge of such sewers as have a rapid and continuous flow, and thereby deliver all they receive before it has had time to undergo decomposition. There is no evidence that typhoid fever is caused by the contained air of thoroughly ventilated soil-pipes. The most active professional enemies of the earth-closet system have never adduced an instance where typhoid fever, or any other cognate disease, has followed its well-regulated use. In *The Lancet* of March 6, 1869, Professor Rolleston, setting forth his objections to the earth-closet, said: "If I am told that the earth-closet is inoffensive, and that the privy is foetid, I answer that a rattlesnake is none the less



dangerous because its rattle is removed; and that, for anything shown or known to the contrary, odor is to infection, deodorization to disinfection, what the noise of the serpent is to its bite." It is nine years since this was written, and amid all the voluminous reports upon the dry-earth system there is no word to sustain Dr. Rolleston's fears. On the other hand, together with much else of similar purport, the evidence of Dr. Monat reports that in those jails of India where the earth system is used, even at the time of the most serious cholera epidemics, this disease, which is so like typhoid in its mode of transmission, never gains a foothold. One would almost be justified in replying to Professor Rolleston, that it is not a question of removing the rattle, but of killing the snake. Investigations made to determine the manurial value of closet earth used many times over indicate a total and absolute destruction, not only of the odor but of the whole combustible material of the added fæces. The result has shown as complete destruction as would attend burning in a furnace.

This destructive oxidation depends upon the well-known concentration upon the surfaces of the interior particles of aerated porous substances. The intensity of the action is in proportion to the fineness of the material, or, in other words, to the total area of its interior surface.

It is perhaps not safe to assume that, in dealing with such dangerous material as typhoid excreta, treatment with dry earth, or ashes, or charcoal will suffice to render it harmless, but it will be more effective in this direction than anything else of which we have knowledge, and will at least prepare it for safe removal.

The physician in considering the treatment of the material in question has one of two sets of conditions to deal with. The fæcal wastes of the household which he is attending are either removed by water-carriage, or thrown into privy vaults. If by water-carriage, they are delivered into a public sewer or into a cess-pool. Sewers, as they usually exist, and cess-pools always and invariably, are so circumstanced as to favor the thorough development and multiplication of the morbid material under consideration. Unfortunately, sewers and cess-pools are so connected with the interiors of houses, with others as well as with that where the disease originated, as to make them too often the means for converting a sporadic case into a centre of infection. Even the house drains and soil-pipes through which the excrement passes on its way to the cess-pool or sewer are very generally as bad as these final receptacles themselves, while almost always the only barrier to the free return of their air and its poisonous freight into our very living rooms is the

water retained by a depression in the pipe (the trap), which water constantly absorbs and transmits the gases presented to it.

Where these water barriers are supplemented with one of the many mechanical check valves recently introduced, this means for the return of the infection is shut off. Where the soil-pipe and drain are freely open at both ends for the transmission of a current of atmospheric air, the danger of the development of the poison is greatly reduced, if not entirely removed. But even here, although we may feel secure so far as the immediate household in question is concerned, it is to be remembered that, at least in the case of a public sewer and of a cess-pool common to several houses, the matter deposited may produce its injurious effect in other families which are less well protected against it. Even where the cess-pool is connected with one house only, to permit the specific poison of typhoid fever to enter it and to spread itself through its accumulated filth is to incur a danger akin to that of establishing a gunpowder vault in one's back yard.

When infected fæces are to be thrown into a water-closet or drain, they should at least be treated with the strongest and most destructive chemical disinfectants, carbolic acid being by no means sufficiently so.

When the fæces of the household are received in a privy vault, it must be accepted as an imperative rule that typhoid dejections must never, under any circumstances, find access to this. Abundant and conclusive evidence shows that such accumulations of fæces only await the introduction of the least germ of any diarrhœal disease to become by means of their exhalations and of their pollutions of the soil, active agencies of development.

Even when the earth-closet system is employed, none of the regular apparatus should be used by the patient, or become the receptacle of his dejections; this for the simple reason that it should be our first object to secure the most complete isolation of the tainted matter from every substance which might foster the increase of its tainting element.

It would be better, perhaps, to stop with this general statement of principles, leaving each practitioner to apply them according to his judgment, but one is tempted to recommend what one believes to be the most efficient process, and I therefore take the liberty of suggesting that a chamber or bed-pan, filled to the depth of an inch with dry earth, or with sifted anthracite ashes, or with powdered charcoal, be used to receive the evacuation; that this be immediately covered with a further inch in depth of dry material, and that the whole be turned into a *shallow* hole in the ground and covered with earth not more than two inches deep, so that it may go through with its decomposition in the upper

soil within easy reach of the oxidizing air. If to be removed quite away from the premises, the earth containing the dejections may be thrown into a barrel or box, each deposit being covered with fresh earth, and *carefully protected against rain.*

It would be out of place here to enter into all the details of the hygienic law. In a paper written for the profession this would be, too, a work of supererogation. At the same time it may be advisable, in this connection, to refer briefly to the manner in which, and the degree to which, the general health is influenced by exhalations from decomposing organic matters in sewers, house-drains, vaults, cess-pools, and cellars. It must have been the frequent experience of all physicians that every question as to the tainting of the air of a house from these sources is met by the assertion that no bad smell has ever been perceived. In the first place, the accustomed nostril is dull to detect a constant odor, and in the next it is hard to make people believe that, where they can smell no offense, there still may be danger. We ourselves know that the juices of the cadaver are most fatally dangerous before offensive decomposition has set in. Those who have given attention to the influence of drain-air in causing disease know very well that the action of this upon the health bears no relation to the intensity of its accompanying odors.

The only safety is to be sought in the absolute freedom of the air that is breathed, and of the water that is drunk, from every species of contamination due either directly or indirectly to organic decomposition. A little rift in the waste-pipe of a wash basin, so slight as to be detected only by the application of tissue-paper, has kept a whole family miserable and complaining, and susceptible to every species of contagion, for years together. Decaying vegetables in a cellar, and decaying filth in the waste-pipe of a kitchen sink, may be regarded as the bane of the existence of half the women in America. Those more serious defects which come of ignorantly arranged plumbing work—by no means of good plumbing work, which is the sanitarian's best aid—are responsible not only for most of the zymotic diseases appearing in the better class of houses, but in like degree for the generally ailing condition of so many of those who pass most of their days and nights in these houses.

The regulation of all these helps to healthfulness is a matter of detail which may well engage the best attention of the profession. Even the cataloguing and classification of the subject here would be impossible. The fundamental principle should always be borne in mind that neither in a sewer, nor in a cess-pool, nor in a house-drain, nor in a soil-

pipe, nor in the smallest waste-pipe should decomposition be allowed to proceed without such an abundant presence of fresh air as will secure its most rapid and complete progress. The same condition of obstructed decomposition which fosters the development of infecting agencies is precisely that which leads to a generally unwholesome and debilitating atmosphere. All investigation of this subject, and all discussion of the *modus operandi* by which unwholesome influences lead to the spread of epidemic diseases and to the lowering of the general health, bring us at the end to the firm belief in the principle covered by Hippocrates' prescription: "Pure air, pure water, and a pure soil."



# APPENDIX.

## LAWS OF RHODE ISLAND.

### IN RELATION TO THE PUBLIC HEALTH, AND THE DUTIES OF THE STATE BOARD OF HEALTH.

#### GENERAL STATUTES.

##### CHAPTER 72.

SECTION 1. If nuisances or other causes injurious to the health of the inhabitants of any town, shall not be removed by the person permitting or erecting the same, pursuant to any order or regulation of the town council of the town, the town council shall thereupon adopt such measures as they shall deem effectual for the removal of such nuisances, or other causes injurious to the health of the inhabitants as aforesaid, at the proper charge and expense of the person erecting or permitting the same.

SEC. 2. The sheriff, his deputies, and the town sergeants and constables of the several towns, shall execute all such precepts and orders as shall be to them directed by said town councils, for carrying into execution the provisions of the section next preceding.

SEC. 3. The town councils of the several towns may designate and establish the place or places where the business of slaughtering cattle and other animals shall be carried on, which designation shall vest in the occupant or owner thereof a right to the use and occupancy of said place or places for the purposes aforesaid, until the same be withdrawn or suspended in the manner hereinafter provided, or until the same shall have been abated as a public nuisance.

SEC. 4. Whenever, in the judgment of the town council of any town, the convenience or health of said town requires that the right of slaughtering, as provided in the section next preceding, should be withdrawn or suspended, the said town council may suspend or withdraw said right, first giving to the owner or occupant of such place or places two months' notice, in writing, of the intention to suspend or withdraw the same.

SEC. 5. Every person who shall, after such notice has been given as aforesaid, commence or continue to exercise or carry on the business of slaughtering cattle or other animals, in such place or places, shall be fined fifty dollars for every day during which he shall continue to exercise or carry on the business aforesaid.

SEC. 6. In case of the suspension or withdrawal by any town council of the said right to slaughter cattle or other animals, the said town shall be liable to the person to whom such right has been granted, for any loss or damage consequent upon the withdrawal or suspension of said right, by any town council, to be recovered at a special court of common pleas, in the manner provided by law for cases within the jurisdiction of said court.

SEC. 7. Whenever the town council of any town shall have designated and established therein a place in which the business of boiling bones, depositing filth, keeping swine, or slaughtering cattle or other animals, may be carried on, as herein provided, every person who shall carry on such business in any other place, shall be fined fifty dollars for each day in which he shall carry on the same.

SEC. 8. Nothing herein contained shall be construed to deprive any farmer, not engaged or concerned in the business of slaughtering cattle or other animals, from erecting or continuing to use any building on his premises, for the purpose of slaughtering his own cattle or other animals, from time to time, as before accustomed to do.

SEC. 9. No person shall carry on the business of expressing oil from fish within any town, but at a place within such town to be designated by the town council thereof.

SEC. 10. Every person violating the provisions of the preceding section, shall be fined not less than one hundred dollars, nor more than five hundred dollars.

SEC. 11. Town councils of the several towns may prohibit burials in the compact or thickly populated parts of any town, and may make such by-laws and ordinances relating to the same, and the use of grounds for burials in such localities, as they may think necessary for preserving the health of such neighborhood, and may enforce such ordinances in the manner provided in the first and second sections of this chapter.

SEC. 12. The provisions of the third, fourth, fifth and sixth sections of this chapter shall extend to the place of any manufacture of, or of working in, any article or substance, the manufacture of which shall not be deleterious to the health of the neighborhood: *Provided*, that prior to any action of the town council under this section, public notice of the pendency of any petition therefor shall be given, in such mode, and for such time, as said council shall prescribe.

SEC. 13. The town councils of the several towns may make such rules and regulations as they shall deem necessary, to regulate and control the construction and location of all places for keeping swine, privy vaults, sinks, sink-drains, sink-spouts, cess-pools, and the outlets thereof, and may provide for the summary removal or reconstruction of all such as shall be by them deemed prejudicial to the public health, and may make rules prescribing the location of stables, and the time and manner of removing manure therefrom, or from privy-vaults or slaughter-houses, and for the driving of animals through the highways of their several towns; and every person violating any ordinance, rule, or regulation, made in pursuance of this section, shall be fined twenty dollars, to be recovered upon complaint and warrant before any justice court, to and for the use of the town wherein such violation shall occur.

## CHAPTER 74.

## OF REGULATIONS FOR THE PREVENTION OF INFECTIOUS AND CONTAGIOUS DISEASES.

SECTION 1. Every commander of any vessel which shall come into any port or harbor of this State, and shall have any person on board sick of the small-pox or any contagious or infectious distemper, or which has had any person sick of such distemper in the passage, or which shall come from any port or place usually infected with the small-pox, or where any other contagious or infectious distemper is prevalent, who shall bring such vessel to anchor in any of the ports of this State within the distance of one mile of any public ferry, pier, or landing-place, or permit or suffer any person on board such vessel to be landed, or any person to come on board such vessel, without a license first had and obtained from the town council of such town where such vessel shall arrive, shall be fined four hundred dollars.

SEC. 2. Such commander, on his first arrival in any port in this State, shall hoist and keep his colors in the shrouds of such vessel, as a signal of having come from any such infected place, or having infection or contagion on board.

SEC. 3. If any person shall come on shore from on board such vessel, without license first had and obtained as aforesaid, the town council may send back such offender immediately on board such vessel, or confine him on shore in such convenient place as to them shall appear most effectual to prevent the spreading of any infection; and the person so offending shall satisfy and pay all charges that shall arise thereon, and shall also be fined forty dollars.

SEC. 4. The town council of the town where such vessel shall arrive shall send a physician, or other suitable person, to examine into and make report to them of the true state of such vessel and the people on board, at the charge of the master or owner of such vessel; and they shall forthwith put on board such vessel some suitable person or persons to secure said vessel, and effectually prevent any communication therewith, at the like charge of the master or owner thereof.

SEC. 5. The town council of such town shall confine on board such vessel, or send to some hospital, or other suitable place, all persons who came in said vessel, for a convenient time, until such of them as have, or are liable to have, the small-pox or other infectious or contagious distemper, are perfectly recovered and cleansed from said distemper, or have passed a suitable quarantine; and also all persons who have gone on board said vessel without license as aforesaid, at the charge and expense of such persons respectively.

SEC. 6. The town council of such town shall appoint suitable persons to take effectual care that all goods, wares, and merchandise imported in such vessel, which they think liable to hold and communicate the infection or contagion, are landed in some suitable place to be appointed by such council, and cleansed in the manner by them directed, before they are permitted to be brought into any house, shop, or warehouse, other than where they are cleansed as aforesaid.

SEC. 7. Whenever such goods are sufficiently aired and cleansed, said persons shall give the owners or possessors thereof a certificate to that effect; and the town council shall allow and order said goods, wares, and merchandise, to be



delivered to the owners thereof; and the charge and expense of airing, landing, and cleansing such goods, wares, and merchandise, shall be borne by the respective owners; and such charge shall be a lien on such goods, wares, and merchandise.

SEC. 8. All goods that are judged by the town council not to be infected shall be delivered to the owners without delay and expense of airing, and as soon as may be consistent with the safety of the town in regard to other parts of the cargo; and all goods, wares, and merchandise, imported into any town by land from any place infected with the small-pox, or other contagious or infectious distemper, shall be aired and cleansed at the discretion of the town council of such town, and at the expense of the owners thereof as aforesaid, or destroyed if necessary.

SEC. 9. All goods imported in such vessel as aforesaid, that shall be clandestinely landed or brought into any house, shop, or warehouse, without a certificate and allowance as aforesaid, or that shall be imported by land as aforesaid, and not cleansed or aired by order of the town council as aforesaid, shall be forfeited; one-third to the use of the State, and the other two-thirds to the use of the person who shall sue for the same.

SEC. 10. The town councils of the respective towns shall fix, settle, and adjust all wages and charges demanded by persons employed by them, to secure such vessel, or to air and cleanse such goods, or to attend upon and nurse such persons as aforesaid.

SEC. 11. If any owner, freighter, mariner, or passenger, as aforesaid, shall refuse to pay such wages and charges so settled, adjusted, and fixed, then the town treasurer of such town shall sue for and recover such wages and charges, and the court where such action is brought shall tax double costs for the plaintiff, if he recover in his said action.

SEC. 12. Whenever the small-pox, or any other infectious or contagious distemper, shall be prevalent in any place or town, all persons who shall come from any such infected place or town into this State by land, before the expiration of ten days after they shall have left such infected place or town, shall be fined not exceeding one hundred dollars, nor less than ten dollars.

SEC. 13. The town council in any town may appoint proper persons at all ferries or places that to them may seem necessary, to examine on oath all persons suspected of violating the provisions of the section next preceding, and on reasonable cause of suspicion, may bring such offenders before some magistrate, that they may be dealt with according to law.

SEC. 14. Every householder or person shall immediately inform the town council of the town wherein he dwells, of any person in the house or tenement occupied by him, who has been taken sick of the small-pox, or any other contagious or infectious distemper, or suspected to be so.

SEC. 15. Every person violating any provision of the section next preceding, shall forfeit twenty dollars to the use of the town, to be sued for in the name of the town treasurer.

SEC. 16. Whenever the town council shall be so notified, they shall make proper examination by some physician or other skilful person; and if it be the small-pox, or other contagious or infectious distemper, wherewith such person is sick, they shall immediately set a proper guard to prevent the spreading of the contagion or infection, and shall remove said person to any such place in the

town as they shall think the most proper to prevent the spreading of the infection or contagion, or continue the said guard as aforesaid, according as to them shall seem necessary; and likewise they shall confine all such persons as may be by them suspected of having taken the distemper, in some proper place, until they are recovered and cleansed from the said distemper, or have performed a suitable quarantine.

SEC. 17. Whenever the small-pox, or other contagious or infectious distemper, shall break out in any house, and the infected persons be confined to such house, the town shall be at the expense of guarding the same, and the owner at the charge of cleansing the same, to be settled by the town council, which charges of cleansing, upon refusal to pay the same, shall be recovered by the town treasurer.

SEC. 18. In case the small pox, or other contagious or infectious distemper, shall break out in any house or family in any town, the town council thereof may remove any inhabitants of said town, visited with the small-pox, or other contagious or infectious distemper, to the hospital in said town, or other convenient place, in order to prevent the spreading of the infection; or otherwise, at their discretion, place a guard around the dwelling-house of the infected person, as to them shall seem necessary.

SEC. 19. So long as the town council of any town shall endeavor to prevent the spreading of the small-pox, any persons who shall visit any person suspected to have the small-pox, or shall go into the house where suspected persons are confined, without a license first had from the town council of the town, or of the attending physician, shall forfeit for every such offence twenty dollars; one-half to the use of the town where such offence is committed, and the other half to the use of the person who shall sue for the same; and such persons, on information of their offence, shall be liable to be confined until they are suitably aired and cleansed, or have performed suitable quarantine, at the discretion of the town council to whom complaint of the same shall be made.

SEC. 20. Whenever any person shall be found to be infected with the small-pox, it shall be the duty of the householder in whose house such infected person may be or reside, within twenty-four hours thereafter, to place a white flag not less than three feet in length and two in breadth, with the words "small-pox," in large black letters on both sides thereof, and so suspended as to be easily read, at or near the front door or principal entrance to such house, on the outside thereof, and to keep said flag up so long as there shall be any danger of taking the infection from said house.

SEC. 21. Every person who shall be convicted of wilfully and purposely spreading the small-pox, or other contagious or infectious distemper, within this State, shall be imprisoned for one year; and if any person shall die in consequence of the spreading of the small-pox, or other contagious or infectious distemper, as aforesaid, the person who shall be convicted of wilfully and purposely spreading the same, as aforesaid, shall be fined not exceeding five thousand dollars, and be imprisoned not more than five years, nor less than one year.

SEC. 22. If any physician, surgeon, or any other person lawfully required by any town council to do any duty relating to the prevention of the spreading of the small-pox, or executing any part of this chapter, shall refuse or neglect to perform the same, the performance thereof being in his power, such physician, surgeon, and other person, shall, for every offence, be fined forty dollars.

SEC. 23. In case any person shall hereafter be sick of any malignant, pestilential, or infectious disease, in any town, so as to endanger his life by being removed, or in case it shall appear that the disease be so spread that the atmosphere, in the judgment of the town council, has become so contaminated as to endanger the lives of those persons who reside or go into the neighborhood of the sick, the town council of such town may cause all such persons within such neighborhood to be notified to remove therefrom within three days; and if after that time any person shall remain there, the said town council may cause him to be forthwith removed at his own expense: *Provided*, that the expense of the removal of the poor, or such as are unable, in the judgment of the town council, to remove themselves, shall be paid out of the town treasury.

SEC. 24. The town councils in the several towns shall provide annually for the gratuitous vaccination of the inhabitants thereof.

SEC. 25. Such councils shall contract with and provide a suitable number of vaccinators to vaccinate as aforesaid; and order the treasurers of the several towns respectively to pay them such compensation as may be previously agreed upon; and the said vaccinators shall give due and reasonable notice of the time and place of meeting for the purpose of vaccination.

SEC. 26. Such vaccinators, as soon after fulfilling said contract as may be convenient, shall place in the several town clerks' offices a book, in which shall be by them respectively recorded, in a fair and legible hand, the name and age of every patient by them vaccinated as aforesaid, and also such other remarks and observations as they may deem useful.

SEC. 27. Such clerks shall safely keep said books for the accommodation of such vaccinators and others, without any compensation, and deliver the same over to their successors; but they may charge lawful fees for searching the same, or for any copies.

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## CHAPTER 75.

### OF QUARANTINE.

SECTION 1. Each seaport town, or the town council thereof, may appoint a health officer for such town, who shall visit all vessels which shall be subject to examination or quarantine, and carry into execution all regulations established by the town council, and shall be at all times accountable to said town council, and shall receive for his services such compensation as said council may allow, to be paid by the owners, agents, or commanders, of such vessels as may be subjected to quarantine or examination.

SEC. 2. Such town council shall cause to be published in one or more newspapers printed in this State, within or nearest the town wherein such rules and regulations shall be adopted, and at the proper cost and expense of the town, all rules and regulations made by them respecting quarantine.

SEC. 3. They shall prescribe from time to time the several ports, places, or countries, from which vessels arriving shall be subject to examination or quarantine.

SEC. 4. They shall designate the particular place in their harbor, bay, or river, adjacent to such town, where all ships or vessels arriving, subject to examination or quarantine, shall come to anchor; and shall define the limits of such quarantine ground, and assign the time for which such ships or vessels shall be detained, and where and how unladen.

SEC. 5. They may appoint a sentinel, who shall be paid by the town and be stationed in some convenient place on shore, or in some boat or vessel properly situated, to hail all ships or vessels which may arrive in such river, bay, or harbor; and if such sentinel shall find any ship or vessel is subject to quarantine, he shall direct the commander thereof to come to anchor within the limits of such quarantine ground, and there remain until visited by the health officer, and to place a signal in said vessel's shrouds in such manner as to be seen at a proper distance.

SEC. 6. Every commander of a ship or vessel who shall, upon being hailed and directed by such sentinel, refuse or neglect to bring his ship or vessel to anchor within the limits as above described, shall be fined not exceeding five hundred dollars, nor less than twenty dollars, to the use of the town.

SEC. 7. The town council may order such ship or vessel to be anchored on the quarantine ground, at the expense of the owners, master, or commanding officer thereof, there to remain until legally discharged therefrom.

SEC. 8. Every person who shall leave any ship or vessel under order of quarantine, without permission from the health officer or the town council of such town, shall forfeit not exceeding twenty dollars; and said town council may order such person to be returned on board of such vessel, there to remain until said council order him to be dismissed.

SEC. 9. If any vessel shall arrive in the waters of this State, bound to the port of Providence, at any time while the quarantine regulations of said city are in force, no person on board such vessel shall enter into the city of Providence, the village of Pawtuxet, or the compact part of the town of Cranston, until such vessel shall have been visited and examined by the health officer of said city, and permission shall have been given by such health officer, or by the board of aldermen of said city, to such person, to enter therein.

SEC. 10. Every person so entering into said city, village or town as aforesaid, without such permission first had and obtained, shall forfeit not exceeding twenty dollars; and said board of aldermen may cause such person to be returned to such vessel in case she is under quarantine, there to remain until permitted to depart therefrom.

SEC. 11. Every sheriff, deputy sheriff, town sergeant, and constable shall carry the rules and regulations of the town council within his precinct, into effect.

SEC. 12. Every forfeiture for the violation of any of the provisions of this chapter shall be sued for in the name of the town treasurer of the town where the offence was committed, and shall enure to such town.

## CHAPTER 76.

## OF CONTAGIOUS DISEASE AMONG CATTLE AND OTHER ANIMALS.

(As amended April, 1878.)

SECTION 1. Every person bringing into this State any neat-cattle or other animals which he knows to be infected with any infectious or contagious disease, or who shall expose such cattle or other animals, known to him to be so infected, to other cattle and animals not infected with such disease, shall be fined not less than one hundred dollars, nor more than five hundred dollars.

SEC. 2. The town councils of the several towns may pass such ordinances as they may think proper, to prevent the spread of infectious or contagious diseases among cattle and other animals within their respective towns, and may prescribe penalties for the violation thereof, not exceeding twenty dollars for any one offence.

SEC. 3. *Repealed at January Session, 1878.*

SEC. 4. The State Board of Health may prohibit the introduction of any cattle or other domestic animals into this State. And every person who shall bring, transport, or introduce any cattle or other domestic animals into this State, after said State Board of Health, or any one of them, shall have issued an order forbidding the same, or after the said Board shall have published for five successive days an order in such newspapers published in this State as the Board may direct, forbidding such introduction, shall be fined not more than three hundred dollars for every offence; and every officer or agent of any company, or other persons who shall violate such order, shall be subject to the fine aforesaid. In case of the introduction into this State of a number of cattle or other domestic animals, contrary to the orders of such Board, the introduction of each animal shall be deemed a separate and distinct offence.

SEC. 5. Said Board shall endeavor to obtain full information in relation to any contagious disease which may prevail among cattle or other domestic animals near the borders of the State, and shall publish and circulate such information at their discretion; and should any such disease break out, or should there be reasonable suspicion of its existence among cattle or other domestic animals in any town in this State, they shall examine the cases, and publish the result of their examination, for the benefit of the public.

SEC. 6. Said Board may appoint suitable and discreet persons, on or near the several highways, turnpike-roads, railroads, and thoroughfares in the State, who shall inquire into all violations of this chapter, and report the same to the Board for immediate prosecution.

SEC. 7. If any person, during the existence of said Board, shall sell, or offer to sell, any cattle or other domestic animals, or any part or parts thereof, known to him to be infected with any contagious disease, or with any disease dangerous to the public health, or shall sell, or offer to sell, any milk from any such cattle or other domestic animals, he shall be fined not more than one thousand dollars, or be imprisoned not exceeding two years, or both, at the discretion of the court.

SEC. 8. The said Board may make all necessary regulations for the prevention, treatment, cure, and extirpation of such disease; and the value of all cattle or

other domestic animals killed by the written order of the Board, shall be appraised by three disinterested persons to be appointed by the Board, such appraisal to be made just before the cattle or other domestic animals are killed, and the amount of such appraisal shall be paid by the State to the owner of such cattle or other domestic animals; and every person who shall fail to comply with any regulation by them so made, shall be fined not more than three hundred dollars, or be imprisoned not more than one year.

SEC. 9. Whenever the said Board shall make and publish any regulations concerning the extirpation, cure, or treatment of cattle or other domestic animals infected with, or which have been exposed to, any contagious disease, such regulations shall supersede the regulations made by the authorities of the several towns and cities upon the same subject; and the operation of such regulations made by said authorities shall be suspended during the time those made by the Board, as aforesaid, shall be in force.

SEC. 10. The said State Board of Health shall keep a record of their doings, and make report of the same to the January Session of the General Assembly next after the time of their appointment, unless sooner required by the Governor.

SEC. 11. All orders, appointments, and notices from the said Board, except the order of notice provided for in section 4, shall bear the signature of the president or chairman, and secretary.

SEC. 12. Every prosecution for a violation of any of the provisions of this chapter, shall be commenced within thirty days from the commission thereof.

## CHAPTER 77.

### OF THE REGISTRATION OF BIRTHS, DEATHS, AND MARRIAGES.

*(As amended April, 1878.)*

SECTION 1. The town clerks of the several towns, or in lieu thereof, any person whom the board of aldermen of any city, or the town council of any town, may appoint for that purpose, are hereby authorized and required to obtain, chronologically record and index, as required by the forms prescribed by the third section of this chapter, all information concerning births, marriages, and deaths, occurring among the inhabitants of their respective towns; and on or before the first Monday of March, annually, to make duly certified returns thereof to the Secretary of the State Board of Health, for each year, ending on the thirty-first day of December, accompanying the same with a list of those individuals, required by law to make returns to him, who have neglected the same, and with such remarks relating to the object of the law, as they may deem important to communicate.

SEC. 2. The Secretary of the State Board of Health shall receive the returns made in pursuance of the preceding section, and annually make and publish, not exceeding one thousand copies, a general abstract and report thereof, in form as

prescribed by section third of this chapter. The Secretary of State shall then cause said returns to be arranged, full alphabetical indices of all the names to be made, the whole to be bound in convenient sized volumes, and carefully preserved in his office, for which he shall receive the sum of fifty dollars.

SEC. 3. The blank forms required to carry out the provisions of this chapter shall, on application, be furnished by the Secretary of the State Board of Health, to clergymen, physicians, undertakers, town clerks, clerks of the Society of Friends, and other persons requiring them, substantially after the following forms, viz.: The record of a birth shall state the date and place of birth, name and sex of the child, whether living or still-born, the name and surname, color, occupation, residence, and birth-place of the parents, and the time of recording, so far as the same can be ascertained. The record of a marriage shall state the date of the marriage, place, name, residence, and official station of the person by whom married, names and surnames of the parties, age, color, occupation, and residence of each, condition (whether single or widowed), what marriage, if second, third, or other marriage, the occupation, birth-place, and name of their parents, and the time of recording, so far as the same can be ascertained. The record of deaths shall state the date of death, name and surname of deceased, the sex, color, and condition (single or married), age, occupation, place of death, place of birth, names and birth-place of parents, disease, or cause of death, and the time of recording, so far as can be ascertained.

#### OF MARRIAGES.

SEC. 4. Every Society of Friends, clergymen and all others, authorized to join persons in marriage, shall make a faithful record of every such rite performed by them, in manner and form aforesaid, and return the same on or before the second Monday of every month, for the last preceding month, to the clerk of the town in which such rite shall have been performed; and no marriage shall be solemnized until the parties shall have signed and delivered to the authority about to solemnize it, or to the clerk of a Society of Friends, a certificate containing the information required for the record of a marriage, as prescribed in the third section of this chapter.

#### OF BIRTHS.

SEC. 5. The clerk of every town shall, annually, in the month of January, collect the facts required by section third of this chapter, in relation to all children born in the town during the year ending the thirty-first day of December next preceding, and for each full report of a birth so obtained, the clerk shall receive ten cents, to be paid by the town in which the birth is recorded.

#### OF DEATHS.

SEC. 6. Whenever any person shall die in the State, it shall be the duty of the physician attending in his or her last sickness, within forty-eight hours after the death, to leave with the family, if any, or persons having the care of the deceased, or to give to the undertaker or person who conducts the funeral, a certificate stating the name of the deceased, the date of the death, and the disease or cause of death.

## OF UNDERTAKERS.

SEC. 7. There may be appointed, by the town authorities of every town, a sufficient number of persons to act as undertakers, removable at the pleasure of the authorities.

SEC. 8. The undertaker, or the person who shall conduct a funeral, or who shall bury or deposit in a tomb the body of any deceased person, shall obtain the facts, required by section third of this chapter in relation to deaths, concerning such deceased person, together with the physician's certificate of the cause of the death, if a physician was in attendance, and on or before the second Monday of the next succeeding month, shall make a return of the facts obtained, together with the physician's certificate, to the clerk of the town in which the death occurred.

SEC. 9. Any town may enact municipal laws, more effectually to attain the objects herein contemplated: *Provided*, they do not conflict with the main and specific object of this act, viz.: to procure the most perfect registration.

## OF FEES.

SEC. 10. The town clerks, or persons recommended and appointed as aforesaid, shall receive for each record of a death made and returned as required by law, and for each record of a marriage made and returned as required by law, twenty cents, to be paid to them out of their respective town treasuries: *Provided*, that the yearly compensation to be paid out of the town treasury as aforesaid, to any one town clerk or person appointed as aforesaid, who shall faithfully perform the duties prescribed by this chapter, shall not be less than five dollars. Undertakers and others making returns of deaths as required in section eight of this chapter shall receive for each full report of a death made to the town clerk, five cents in the cities of Providence or Newport, and ten cents in the other towns of the State.

SEC. 11. If any clergyman, physician, undertaker, town clerk, clerk of any meeting of the Society of Friends, or other persons, shall wilfully neglect or refuse to perform any of the duties imposed on, or required of him, by this chapter, he shall, at the discretion of the court trying the cause, be fined not exceeding twenty dollars for each offence, one-half thereof to the use of the town in which the offence shall occur, the other half to the use of the person who shall complain of the same.

SEC. 12. In order that it may be more surely ascertained that no clergyman, physician, coroner, undertaker, or clerk of the Society of Friends, neglects to make the returns specified in this chapter, each of the said parties shall cause his name and residence to be recorded in the clerk's office of the town where he resides.

SEC. 13. No letters of administration, or letters testamentary, shall be granted by any court of probate, upon the effects or estate of any person, until the death of such person, or the facts from which the same is presumed; shall be duly certified, as near as may be, to the town clerk, in order that the same may be duly registered according to the provisions of this chapter.

SEC. 14. Such books or registers, or a certificate duly certified by the town clerk, or person appointed as aforesaid, as containing a full copy of the record



of any marriage, birth, or death, shall hereafter be admitted in any court in this State, as *prima facie* proof of any marriage, birth, or death.

SEC. 15. Births, marriages, and deaths of non-residents, shall be distinguished from those of residents, in the returns, by being arranged separately.

SEC. 16. The Secretary of the State Board of Health may, from time to time, vary the forms of returns, and require such additional information as he may consider necessary, to effect the object of this chapter.

SEC. 17. *Repealed January Session, 1878.*

SEC. 18. The town clerks or other officers appointed under this chapter, to collect, record, and return the births in the several towns, shall receive fees therefor as follows: For collecting the facts required in relation to births, fifteen cents each; for making record and return of these facts as required by law, twenty cents each for the first fifty entries in each calendar year, and ten cents each for each subsequent entry and return.

SEC. 19. The returns required to be made by clerks of the supreme court, in relation to divorces, to the Secretary of the State Board of Health, or a prepared abstract thereof, shall be published in the annual report upon the births, marriages, and deaths in the State.

## CHAPTER 119.

### OF MEDICINES AND POISONS.

SECTION 1. No person, unless a registered pharmacist, or registered assistant pharmacist in the employ of a registered pharmacist, or unless acting as an aid under the immediate supervision of a registered pharmacist, or a registered assistant pharmacist, within the meaning of this chapter, shall retail, compound, or dispense medicines or poisons, except as hereinafter provided.

SEC. 2. Every person, in order to be a registered pharmacist or a registered assistant pharmacist, within the meaning of this chapter, shall be either a graduate in pharmacy, a practicing pharmacist, or a practicing assistant in pharmacy. Graduates in pharmacy shall be such as have obtained a diploma from a regularly incorporated college of pharmacy, and shall have presented satisfactory evidence of their qualifications to the State Board of Pharmacy. A practicing pharmacist shall be deemed to be a person who, on the 24th day of March, A. D. 1871, kept, and continued thereafter to keep an open shop for compounding and dispensing the prescriptions of medical practitioners, and for the retailing of drugs and medicines, and who shall give to the State Board of Pharmacy satisfactory evidence of his qualifications, and shall have declared his intentions in writing of keeping open shop for the compounding of prescriptions and the retailing of drugs and medicines; and such other persons as shall have given to the State Board of Pharmacy satisfactory evidence of their qualifications, and shall have declared their intentions in writing of keeping open shop for the compounding

of prescriptions and the retailing of drugs and medicines. A practicing assistant in pharmacy shall be deemed to be a person who shall have served three years' apprenticeship in a shop where the prescriptions of medical practitioners are compounded, and shall have passed a satisfactory examination before the State Board of Pharmacy.

SEC. 3. The State Board of Pharmacy shall consist of seven persons, to be appointed by the Governor from the registered pharmacists of the State, and shall hold office for the term of three years, and until their successors are appointed. The members of the pharmaceutical board of the State, appointed by the Governor, shall constitute, for the term for which they were appointed, the State Board of Pharmacy, within the meaning of this chapter. On the first of July, A. D. 1878, and in every third year thereafter, the Governor shall appoint the State Board of Pharmacy; and in case of vacancy at any time, arising from resignation, death, or removal from the State, the Governor shall have power to fill such vacancy from the registered pharmacists of the State. Four members of said board shall constitute a quorum. Said board shall organize by the election of a president and secretary; both of whom shall sign all certificates and other official documents. Said board shall meet twice a year, and shall have power to make by-laws and all necessary regulations, not repugnant to law, for the proper fulfilment of their duties. The secretary of said board shall also be registrar of pharmacists. The duties of said board shall be, to examine all applicants for registration; to direct the registration by the registrar of all persons properly qualified or entitled thereto, and report annually to the General Assembly on the condition of pharmacy, together with the names of all registered pharmacists and assistant pharmacists. The duties of the registrar of pharmacists shall be, to keep a book in which shall be entered, under the supervision of the State Board of Pharmacy, the name and place of business of every person who shall apply for registration. The registrar shall note the fact against the name of any registered pharmacist, or assistant pharmacist, who may have died or removed from the State, or disposed of or relinquished his business, and shall make all necessary alterations in the location of persons registered under this chapter.

SEC. 4. Every person applying for examination and registration shall pay to the State Board of Pharmacy ten dollars, and on passing the examination required, shall be furnished, free of expense, with a certificate of registration. Every registered assistant pharmacist may, with the consent of said board, be entitled to registration as a registered pharmacist, and shall be furnished with a certificate of registration, for which certificate he shall pay the registrar one dollar. Every certificate issued by said board shall be renewed annually, for which renewal one dollar shall be paid to the registrar. The fees received for examinations, registration, and certificates, shall be appropriated to defray the expenses of the State Board of Pharmacy.

SEC. 5. Every person, not a registered pharmacist, who shall keep open shop for the retailing and dispensing of medicines and poisons; or who shall take, use, or exhibit the title of registered pharmacist; and every person who shall violate any of the provisions of this chapter, shall, upon the first conviction, be fined fifty dollars, and upon the second, and every subsequent conviction, shall be fined one hundred dollars; and all fines recovered shall enure, one-half to the State,

and the other half to the complainant: *Provided, however*, that in towns or parts of towns where there is no registered pharmacist within three miles, it may be lawful for any person to sell the usual domestic medicines put up by a registered pharmacist, and marked with his label; such person procuring annually a certificate from the State Board of Pharmacy therefor, and paying one dollar for such certificate.

SEC. 6. Nothing hereinbefore contained shall apply to any practitioner of medicine, who does not keep open shop for the retailing, dispensing, or compounding of medicines or poisons, nor prevent him from administering or supplying to his patients such articles as he may deem fit and proper; nor shall it interfere with the making and dealing in proprietary medicines (popularly called patent medicines), unless such medicines be wholly or in part composed of some of the articles enumerated in schedule A, of this chapter; nor with the business of wholesale dealers in supplying medicines and poisons to registered pharmacists and physicians, and for use in the arts.

SEC. 7. No person shall hereafter sell, either by wholesale or retail, any of the poisons enumerated in schedule A, of this chapter, without distinctly labelling the bottle, box, vessel, or paper, and wrapper or cover in which said poison is contained, with the name of the article, the word POISON, and the name and place of business of the seller; and every registered pharmacist selling or dispensing any of said poisons shall first enter in a book, to be kept for that purpose only, and subject always to inspection by the State Board of Pharmacy, or any officer or agent thereof, or other proper authority, and to be preserved for at least five years, a record of the same in accordance with schedule B, of this chapter: *Provided*, that if any of said poisons form a part of the ingredients of any medicine or medicines compounded in accordance with the written prescription of a medical practitioner, the same need not be labelled with the word poison; but all prescriptions, whether or not composed in part or in whole of any of said ingredients, shall be carefully kept by the pharmacist on a file or in a book, used for that purpose only, and numbered in the order in which they are received or dispensed, and every box, bottle, vial, vessel, or packet containing medicines so dispensed, shall be labelled with the name and place of business of the registered pharmacist so dispensing said medicine, and be numbered with a number corresponding with that on the original prescription, retained by said pharmacist on such book or file. Such prescription shall be preserved at least five years, and shall be open to the inspection of the writer thereof, and a copy shall be furnished free of expense, when demanded by either the writer or the purchaser thereof.

SEC. 8. Every person who shall knowingly adulterate, or cause to be mixed, any foreign or inert substance with any drug or medicinal substance, or any compound medicinal preparation recognized by the pharmacopœia of the United States, or of other countries, as employed in medicinal practice, with the effect of weakening or destroying its medicinal power, or who shall sell the same knowing it to be adulterated, shall, in addition to the penalties prescribed in section five hereof, forfeit to the use of the State, all articles so adulterated found in his possession, and shall be deprived of the right of practicing as a pharmacist in this State thereafter. Whenever complaint shall be made of any violation of the provisions of this section, the State Board of Pharmacy, on being notified



## CHAPTER 289.

AN ACT IN AMENDMENT OF CHAPTER 74, OF THE GENERAL STATUTES, "OF REGULATIONS FOR THE PREVENTION OF INFECTIOUS AND CONTAGIOUS DISEASES."

*It is enacted by the General Assembly as follows:*

SECTION 1. Every physician, householder or other person, having knowledge of the existence of small-pox in any town shall immediately give information thereof to the town clerk of the town in which the person sick with the small-pox resides, or may be, and in cities shall give like information to the superintendent of health.

SEC. 2. Whenever the town clerk of any town shall have knowledge, or shall have received information as provided in the preceding section of the existence of small-pox in his town, he shall forthwith give or cause notice thereof to be given to the town council of such town, at the expense of the town, to be audited and allowed by the town council.

SEC. 3. Every physician, householder, town clerk, or other person, violating any provision of the two preceding sections, shall pay a fine of twenty dollars, or be imprisoned not exceeding ninety days, either or both in the discretion of the court.

SEC. 4. Whenever any person shall be found to be infected with the small-pox any town, the town council of such town and the superintendent of health in the several cities, shall, within twenty-four hours after receiving information thereof, cause a white flag with the words "SMALL-POX" in black letters, not less than six inches in length, inscribed thereon, so suspended or fastened as to be easily read, to be placed at or near the front door or principal entrance of the building in which such infected person may be or reside, and to keep such flag so placed so long as there shall be any danger of taking the infection from said building.

SEC. 5. Every person who shall deface or remove any such flag without the permission of such town council or superintendent of health, shall pay a fine of twenty dollars and be imprisoned not exceeding ninety days.

SEC. 6. Every person in any house where there is any one sick with the small-pox or other contagious or infectious disease, or who is in any small-pox hospital, who shall voluntarily leave the same without a permit from the town council, or the physician employed by such town council, or from the superintendent of health in cities, shall pay a fine of twenty dollars and be imprisoned not exceeding ninety days.

SEC. 7. This act shall take effect from and after its passage, and all acts and parts of acts inconsistent herewith are hereby repealed.

## CHAPTER 488.

AN ACT IN AMENDMENT OF CHAPTER 77, OF THE GENERAL STATUTES, "OF THE REGISTRATION OF BIRTHS, DEATHS, AND MARRIAGES."

*It is enacted by the General Assembly as follows:*

SECTION 1. The words in Section 1 of said Chapter 77, "upon the written recommendation of an authorized committee of the Rhode Island Medical Society," and the words in Section 10 of said chapter "recommended and," are hereby stricken out.

SEC. 2. Section 6 of said Chapter 77 is hereby amended so as to read as follows: "Whenever any person shall die, or any still-born child shall be brought forth in this State, it shall be the duty of the physician attending at such bringing forth or last sickness, if any physician so attended, within forty-eight hours after such death or bringing forth, to leave with the family, if any, or person having the care of the deceased, or the person bringing forth such still-born child, or to give to the undertaker or person who conducts the funeral, a certificate stating in case of a death the name of the deceased, the date of the death and the disease or cause of the death, and in case of the bringing forth of a still-born child, the date and the cause of such child being brought forth still-born."

SEC. 3. Section 8 of said chapter is amended so as to read as follows: "The undertaker, or the person who shall conduct a funeral, or who shall bury or deposit in a tomb, or who shall remove from this State or otherwise dispose of the remains of any deceased person or still-born child, shall first obtain the physician's certificate required by Section 6 of this chapter, if a physician was in attendance upon such person who has deceased, or the person bringing forth such still-born child, and shall return the same, together with his own certificate of the facts required by Section 3, as hereby amended, on or before the second Monday of the next succeeding month, to the clerk of the town where such death or bringing forth took place."

SEC. 4. Section 14 of said chapter is amended so as to read as follows: "The person appointed as provided in Section 1 of this chapter, shall be entitled to have the custody of all records of births, deaths or marriages of the town or city for which he is appointed, whether made under the statute, now in force or any former statute, and a certificate signed by him as town or city registrar, certifying that any written or printed statement of any marriage, birth or death is a true copy of the record in his custody, shall be admitted as *prima facie* proof of such marriage, birth or death.

SEC. 5. This act shall take effect from and after its passage.

## CHAPTER 680.

## AN ACT TO ESTABLISH A STATE BOARD OF HEALTH.

*It is enacted by the General Assembly as follows :*

SECTION 1. The Governor, with the advice and consent of the Senate, shall appoint six persons, two from the county of Providence, and one from each of the other counties, who shall constitute the State Board of Health. Of the persons so appointed, at least three shall be well educated physicians and members of some medical society incorporated by this State. The Governor may remove any member for cause, at any time, upon the written request of two-thirds of the Board.

SEC. 2. The six persons first appointed, shall be appointed for one, two, three, four, five and six years respectively, and hereafter, the Governor, with the advice and consent of the Senate, shall appoint one member of the Board annually, for the term of six years from the first day of July. Any appointment to fill a vacancy, shall be for the remainder of the term.

SEC. 3. The Board shall take cognizance of the interests of life and health among the citizens of the State; they shall make investigations into the causes of disease, and especially of epidemics and endemics among the people, the sources of mortality, and the effects of localities, employments, conditions and circumstances on the public health, and shall faithfully do all in their power to ascertain the causes and the best means for the prevention of diseases of every kind in the State. They shall publish and circulate, from time to time, such information as they may deem to be important and useful for diffusion among the people of the State, and shall investigate and give advice in relation to such subjects relating to the public health, as may be referred to them by the General Assembly, or by the Governor when the General Assembly is not in session.

SEC. 4. The State Board of Health shall also investigate the subject of diseases among cattle or other animals, and perform all the duties which have been delegated to the Board of Cattle Commissioners in Chapter 76, of the General Statutes of the State.

SEC. 5. Section 3, of Chapter 76, of the General Statutes, is hereby repealed, and the Board of Cattle Commissioners heretofore constituted under authority of said section, is hereby abolished.

SEC. 6. In every section of Chapter 76, of the General Statutes, where the word "commissioners" occurs, it shall be construed to mean State Board of Health.

SEC. 7. The State Board of Health shall receive the returns of births, marriages, deaths and divorces, and shall prepare the annual report upon the registration of the same as now required by law, but after the report is prepared, the returns shall be deposited in the office of the Secretary of State, to be bound and indexed by him as heretofore.

SEC. 8. Wherever the words "Secretary of State" occur in sections 1, 2, 3, 16 and 19, of Chapter 77, of the General Statutes, they shall be construed to mean Secretary of the State Board of Health, and in the sixth line of Section 2, of said

chapter, the word "he" shall be construed to mean Secretary of State. Section 17, of Chapter 77, of the General Statutes is hereby repealed.

SEC. 9. The Board shall meet in the city of Providence once in three months, and as much oftener as they may deem necessary. No member of the Board, except the Secretary, shall receive any compensation for his services; but the actual personal expenses of any member, while engaged in the duties of the Board, shall be paid by the State.

SEC. 10. The Board shall elect a well qualified physician as their Secretary.

SEC. 11. The Secretary shall perform and superintend the work prescribed in this law and such other duties as the Board may require, and he shall receive such salary, not in excess of twelve hundred dollars per annum, as the Board may determine. He shall hold his office at the pleasure of the Board, but may be removed at any regular meeting by a majority vote of the members thereof.

SEC. 12. The Governor shall provide a suitable office for the Board, in the city of Providence, and the actual expenses of the Board and of the members thereof, when certified by the Chairman and approved by the Governor, shall be paid from the treasury of the State.

SEC. 13. The Board shall make a report in print, to the General Assembly, annually in the month of January, of its proceedings during the year ending on the thirty-first day of December next preceding, with such suggestions in relation to the sanitary laws and interests of the State as they shall deem important.

SEC. 14. All acts and parts of acts inconsistent herewith are hereby repealed.

SEC. 15. The several town councils and boards of aldermen shall still be *ex-officio* boards of health in their respective towns, as is now by law provided; *provided, however*, that the city council of any city may appoint a board of health for such city, which shall have all the powers and duties now conferred by law upon the board of aldermen as a board of health.

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NOTE.—There are, also, in addition to the preceding Chapters, other Statutes having relation to the public health and protection of life, and providing for the inspection of milk, of meats, of kerosene and other coal oils, of saleratus, soda, cream of tartar, etc.





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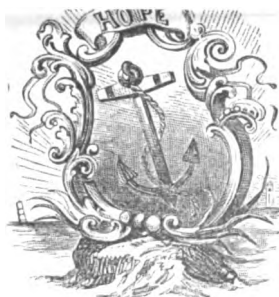
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SECOND ANNUAL REPORT  
OF THE  
STATE BOARD OF HEALTH,

OF THE

---

*Compliments of*  
*Chas. H. Fisher, M. D.*  
*Sec. of the State Board of Health and State Registrar*  
*of Vital Statistics,*  
*17 College St. Providence, R. I.*  
*Please acknowledge receipt.*



PROVIDENCE:  
E. L. FREEMAN & CO., PRINTERS TO THE STATE.  
1880.





## GENERAL REPORT OF THE BOARD.

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*To the Honorable the General Assembly :*

The State Board of Health of the State of Rhode Island, herewith presents, embodied in the Second Annual Report of the Secretary of the Board, a record of its general proceedings during the year ending December 31st, 1879:

The Report of the Secretary is designed to be what the word implies, i. e., an account of the *general* action of the Board, and the *general* work of the Secretary during the year, and not including many investigations of limited importance, the processes and results of which it was not deemed expedient to present, and also, not including an account of some investigations in progress, but not sufficiently advanced to show definite results.

The members of the Board at the close of the year were the same as at the organization, with the exception of Dr. Oliver C. Wiggin, who was appointed a member by the Governor in April, to fill the vacancy caused by the resignation of the Secretary.

Dr. A. G. Sprague, one of the original members, whose term of office had expired, was reappointed by the Governor at the May Session of the General Assembly.

### VITAL STATISTICS.

In the body of the Report of the Secretary will be found the Vital Statistics of the State, for the year 1878, with comments on the same, in regard to the relations which the several classes of events bear to each other, and the relations of each of the several classes to season, sex, percentage, age, locality, &c., during that year. There will also

be found comparisons of one year with another, in regard to the different relations above mentioned, and also comparisons of the same during periods of from ten to twenty-six years.

Of the *causes* of death, a considerable number of summaries and synopses for long periods of years are given, presenting various comparisons, and showing the various relations of the causes, with comments.

It had been the design of the Secretary to have prepared, as an appendix to this Report, a summary of the Vital Statistics of the State for the year 1879; but up to this date, and the completion of the press work of the Report, of the Secretary, the Registration Returns for that year have not all been received from the towns.

These statistics are a part of those prepared by the Secretary of the Board for the Twenty-Sixth Registration Report on the Births, Marriages and Deaths, in Rhode Island, in 1878.

The value of the complete Vital Statistics of a State, in their legal, social and sanitary relations, is too highly appreciated by all well informed persons, to need commendation.

#### MONTHLY RETURNS OF PREVAILING DISEASES.

At the commencement of the year, the Secretary issued blank forms for the return by the medical correspondents in the several towns of the State, of the acute diseases prevalent in their several circuits, with the various attendant circumstances of the same, during each month of the year. Suggestions in regard to these returns, with questions and blank forms, and tabulated summaries of the monthly reports, may be found on pages 148 to 169, inclusive.

#### ANNUAL REPORT WITH TOPOGRAPHY OF TOWNS.

At the close of the year it seemed desirable that a report, giving an account of the general status of the public health in the several sections of the State, during the entire year should be made, and also a description of such topographical and industrial features, conditions and circumstances, as appertain to each of the several towns, or portions of towns, whether general or peculiar, which possibly or presumably might be concerned in the production of disease.

A circular sent to correspondents, and replies thereto, may be found in the Secretary's Report, on pages 170 to 199, inclusive.

#### REPORTS FROM TOWNS,

##### *In Relation to Legal Sanitary Measures taken in 1879.*

For the purpose of ascertaining what ordinances had been passed, or what legal action had been taken by town councils, or local boards of health, during the year 1879, in the direction of public sanitation, the following inquiry was forwarded to the town clerks of all the towns in the State:

“What legal measures or regulations have been adopted, or work of a public or private nature contemplated, commenced or completed in 1879, by the consent, or under the direction of the town council of your town, or any legally authorized health officer or board of health in the town, in relation to the promotion of the public health.”

The replies to the above interrogatory may be found on pages from 200 to 208, inclusive.

#### CATTLE COMMISSION.

By reference to the report of the Secretary, it will be seen that the attention of the Board has been largely and earnestly directed to the protection of the public from the great pecuniary losses which would otherwise have occurred from the spread of that insidious disease called glanders. More than 2,000 horses have been examined, and a large portion of those affected with the disease which have come to the knowledge of the Board—numbering forty on the record of the Secretary—were found existing under circumstances rendering the infection of a large number of other animals almost certain, if the diseased animals had not been removed; and, doubtless, some of the horses since destroyed, and others still alive were infected by them. An account of the general proceedings of the Board in this department of its work, will be found on pages 209 to 228 of the Secretary's report.

## ARTIFICIAL FEEDING OF INFANTS.

This essay, for which the Trustees of the Fiske Prize Fund, awarded the premium of two hundred dollars in June 1879, needs no commendation in this place. The valuable information presented, in regard to the dangers of injudicious methods of feeding, the use of improper kinds of diet, and improper modes of preparation; the suggestions as to the proper kinds of food; the best modes of preparation and the most rational methods of feeding, will be at once appreciated by the reader.

## VENTILATION OF SCHOOL HOUSES.

This paper, written by one of the leading teachers of the State, whose unwearied labors in promoting the physical, as well as intellectual development of his pupils are well known, will present opinions based upon a long period of painstaking and persistent study of the subject.

It will be of especial value at this time, when opinions as to the best methods of securing the most perfect ventilation, are so various and many times so conflicting, as having the merit of a practical exemplification.

## PROPER DISPOSITION OF THE EXCRETÆ OF THE INTESTINES AND KIDNEYS, SEWERAGE OF THE DWELLINGS, AND COLOR-BLINDNESS.

These papers have all a practical value, presenting a large amount of information of a novel and interesting character.

Respectfully submitted,

DAVID KING, *Chairman.*

ELISHA DYER, JR.,

OLIVER C. WIGGIN,

GEORGE W. JENCKES,

ALBERT G. SPRAGUE,

WM. E. C. WARDWELL,

CHARLES H. FISHER, *Secretary.*

JUNE 1, 1880.

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“	“	“ “ TOWN CLERKS.
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## ARTIFICIAL FEEDING OF INFANTS.

## VENTILATION OF SCHOOL HOUSES.

## SEWERAGE OF THE DWELLING.

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## REPORT OF THE SECRETARY.

---

*To the Honorable the General Assembly, and the members of the State Board of Health of Rhode Island :*

Herewith is respectfully submitted the Second Annual Report of the Secretary of the Board.

It will present an account of the more public proceedings of the Board, and the work of the Secretary for the year ending December 31st, 1879.

The events of the year in regard to the average condition of the public health throughout the State, have not varied so greatly from the ordinary incidents of previous years, as to call for special action or remark.

The occurrence of fatal forms of disease in portions of the State, and especially of scarlatina in an epidemic form, in the city of Providence, and a few other localities, will be noticed in detail in another part of this report.

The proceedings of the Board in relation to its several duties, in the three departments of its work, namely, the investigation of the causes of disease, the supervision of vital statistics, and the superintendence of contagious diseases among domestic animals, will be presented more fully in detail, when these several departments of work are brought forward as topics for special consideration and report.

### MEETINGS OF THE BOARD.

During the year there were, beside the regular quarterly meetings, three special meetings at which business was transacted, and there were several called meetings, at which there were not a sufficient number of members present to constitute a quorum.

At the adjourned *quarterly* meeting held APRIL 16, 1879, Dr. O. C. Wiggin, appointed by the Governor to fill the vacancy in the membership of the Board, occasioned by the resignation of Dr. C. H. Fisher, was present, and upon final qualification, was cordially welcomed by the older members.



At this meeting the following resolution, which will explain itself, was also passed:

"That inasmuch as the Secretary has by resignation, ceased to be a member of the Board, it is hereby ordained that he shall retain and exercise the same authority as when a member of the Board, to order the examination or safe keeping of any animal, suspected of having a contagious disease dangerous to life, and also the authority to order the killing and burying of such animal if deemed advisable."

At this meeting it was also voted,

"That the Secretary of the Board prepare a brief statement of the most apparent or obvious symptoms of the disease called Glanders or Farcy, in style for popular comprehension, and for the purpose of general distribution, in the form of circulars or tracts."

At a meeting held on WEDNESDAY, MAY 21, 1879, among other transactions, including a paper by the Secretary, giving the most prominent and obvious symptoms of Glanders and Farcy in horses, and which will be further alluded to on another page, was the passage of the following resolution, to wit:

*Resolved*, That for the purpose of greater certainty in securing a quorum at every meeting of the State Board of Health, it is desirable that the Secretary be made a member *ex-officio*, and the Chairman is hereby requested to present the said resolution to the Honorable the General Assembly, at the May session of 1879, in Newport.

The act establishing the State Board of Health, provides that the terms of office of persons appointed to membership on the Board, shall commence on the first day of July. On account of that provision, the Board has made the *quarterly* meeting in July the ANNUAL MEETING for the election of officers, and for such other transactions as usually come before the annual meeting of any corporate body.

Inasmuch as the act requires the annual report to comprise the regular calendar year, ending December 31st, and as the fiscal year in Rhode Island now covers the same period of time, it is somewhat embarrassing to have the annual meeting of the Board in the middle of the year.

It is hoped that an early amendment of the act, making the term of membership to commence on the first day of January, will remove all annoyance in respect to the annual meeting.

## ANNUAL MEETING.

Following the precedent of the previous year, the Board held the annual meeting on the first WEDNESDAY in JULY.

After the usual routine business of regular meetings, the Board proceeded to the election of officers, for the year ending on the first Wednesday of July, in the year 1880, with the following result, namely:

For Chairman, DAVID KING, M. D. . . . . Newport.

For Secretary, CHARLES H. FISHER, M. D. . . . . North Scituate.

For Auditor, Hon. ELISHA DYER, Jr. . . . . North Kingstown.

The following standing committees were also appointed:

DAVID KING, M. D., On topography and diseases of Newport.

Col. ELISHA DYER, Jr., On the domestic economy of food in its relation to public health.

GEORGE W. JENCKES, M. D., On epidemic, endemic and contagious diseases.

OLIVER C. WIGGIN, M. D., On the relation of public schools to the public health.

W. T. C. WARDWELL, Esq., On the relation of buildings, public and private, to the public health.

ALBERT G. SPRAGUE, M. D., On the relation of food and drinks to the public health.

At the annual meeting, the following question, which had been previously considered, was again discussed:

Is it advisable to furnish physicians, practicing in towns where burial permits are not required, with postal cards, upon which blank certificates of death, causes of death, &c., are printed, to be filled out by said physicians, in case no certificate of such death, and cause of death, be given the undertaker, or any other person, to be sent to the town clerk of the town in which such death occurred, within ten days after the event of such death; the said postal return of death to be then sent to the Secretary of the State Board of Health?

As a result, the Secretary was ordered to issue such blank postal card returns of death to physicians practicing in towns where burial permits are not required, with proper instructions in regard to the purpose and manner of use.

Further remarks will be made in relation to the purpose of the postal returns of death, in another place.

At a meeting held at the office of the Board, on WEDNESDAY, AUGUST 20, 1879, among others, the following transactions are a part of the records of the proceedings: "The Board ordered the publication of the circular or tract, prepared by order in April, and afterwards abridged by instructions from the Board." Said tract presenting the most obvious symptoms of glanders and farcy in horses.

It was also "ordered that the said tract be supplemented by directions for disinfecting stalls and other premises, where animals affected with contagious diseases dangerous to life had been kept;" and also, "that the said tract should contain the regulations adopted by the Board, in relation to contagious diseases among domestic animals, together with extracts from the General Statutes, showing the authority for the enforcement of the same."

At the same meeting, "the Secretary was authorized, if deemed expedient, to cause an inspection to be made of any or all the public or private stables in the city of Providence and vicinity."

This action of the Board, and the results, will be noticed in another place.

A committee was also appointed "to take into consideration the expediency of establishing a hospital for diseased horses, declared to be suspected, by competent authority, but suspicion not yet confirmed, of having glanders or farcy."

This transaction will also be referred to again, and reported upon in another place.

At the same meeting, a motion prevailed "To recommend to the Mayor and Board of Aldermen of the city of Providence, the consideration of the propriety of thoroughly cleansing and drawing off the water, *daily*, from the public horse watering places, as a means of diminishing the liability to infection from glandered horses having access to them."

This will be again referred to.

The Board also at the same meeting adopted a new rule or regulation, "which shall stand as regulation third, in relation to contagious diseases among domestic animals." It is as follows:

"No horse or other animal, declared by competent authority to be affected with glanders or farcy, shall hereafter be allowed to be kept for experiment."

The Board also, "in compliance with a communication from His Excellency the Governor, instructed the Secretary to notify the au-

thorities of the towns of North Kingstown and Jamestown that health officers should be appointed, and quarantine regulations adopted immediately, for the protection of their own citizens, and those of other towns."

The Governor's communication was as follows:

STATE OF RHODE ISLAND.

EXECUTIVE DEPARTMENT,

NEWPORT, August 18, 1879.

*Dr. C. H. Fisher, Secretary of the State Board of Health :*

SIR.—I request the immediate attention of your Board to the necessity of advising the Town Councils (acting as Boards of Health of the towns of Jamestown and North Kingstown, Wickford,) of the most prompt action on their part, in appointing health officers and establishing quarantine regulations. There is this day in the waters of Dutch Island Harbor, in the jurisdiction of Jamestown, a schooner from San Domingo, on board of which the wife of the captain and two of the crew have died within sixteen days, of *yellow fever*. There is nothing to prevent other infected vessels coming into the harbor, and I desire you to summon your Board together forthwith and take such prompt action in the premises as is proper.

I am, sir, your obedient servant,

CHARLES C. VAN ZANDT, Governor.

It may be as well to state here, that the notices were given as ordered, and the President of the Town Council of Jamestown, Hon. T. C. Watson, replied in three days thereafter that the Town Council of that town had held a meeting, and had instructed him "to ask for information as to the duties and powers of the Council in regard to quarantine regulations," as this was the first time such regulations had been called for.

The Secretary drew up some regulations to submit to the authorities of Jamestown, as requested, which were modified and enlarged by suggestions from Dr. Elisha Harris, Sanitary Inspector of the National Board of Health for the North Atlantic Coast, and Collector Pratt, of Newport.

The regulations proposed, premising that a health officer (who need not necessarily be a physician) should be appointed, were as follows:

I. That it shall be the duty of the health officer to visit all vessels immediately, on coming to anchor within the jurisdiction of the town of Jamestown, to examine into the sanitary condition of said vessels by personal inspection or otherwise as in his judgment may seem best.

II. That in case the said health officer shall find on board any vessel, any contagious or infectious disease, or that there *has been* any such disease on board said

vessel, or any vessel that has been recently in any port where any infectious disease is prevalent, he shall cause a yellow flag to be hoisted and kept constantly in the shrouds during the time the said vessel shall remain within the jurisdiction of the said town, and shall also require the commander of such vessel to give notice of the occurrence of any new case of infectious disease on board of said vessel, by such signals as the said officer may devise.

III. Said health officer shall allow no person to leave any vessel infected with a disease dangerous to life, or any vessel suspected of such infection, or go on board or visit any such vessel, without his permission.

IV. All supplies of every kind whatsoever shall be taken on board such vessel *only* by permission and under the direction of said health officer, and no articles of any kind whatsoever shall be taken out of or from such vessel to any landing place.

V. Every person who shall violate any of the regulations hereby adopted by the Town Council of the town of Jamestown, shall be deemed guilty of a misdemeanor, punishable by fine or imprisonment, in conformity with the General Statutes, and at the discretion of the court by which such offender shall be tried.

These regulations were adopted by the Town Council of Jamestown, immediately after their receipt.

In regard to the town of North Kingstown, it may be said that a necessity for the establishment, by the Town Council, of formal quarantine regulations, did not appear to exist. There is no harbor within its precincts, where coasting vessels from extreme southern ports, or vessels from foreign ports, are expected to put in for refuge or for supplies. The comparatively small number of vessels arriving in the harbor, and at the dock in Wickford, are mostly well known, and the arrival of a strange vessel, or any vessel in those waters from any suspected port, would be at once known to the authorities, and immediate steps taken for the public protection.

In justice to the authorities of the town of Jamestown, it should be said, that no danger had been apprehended from vessels hailing from infected ports, if any, and lying in Dutch Island Harbor, in the immediate vicinity of the shores of the town, for the reason that communication with such vessels was of infrequent occurrence, and from the expectation that proper notice would be given of any distress on board of any vessel in the harbor, and especially the fact of the presence, or suspicion of the presence, of any infectious disease on board.

It will be seen, however, that persons in the vicinity of the harbor were not exempt from danger, as there was nothing to prevent, if they desired to do so, persons coming on shore directly from infected vessels, and entering houses on shore; and when it is remembered that

not infrequently, during a stress of weather, from one hundred to one hundred and fifty sail of vessels find anchorage in Dutch Island Harbor, and during the warmest period of the year many of them have their last departure from ports infected with yellow fever, the necessity of every precaution will be apparent.

At the quarterly meeting of the Board on WEDNESDAY, OCTOBER 1st, 1879, the Secretary reported the printing and distribution of 5,000 copies of the Public Health Tract, No. 3, entitled "Glanders and Farcy." An account of the mode of distribution will be given in another place.

The Secretary also reported having employed a veterinary expert, to visit stables where glanders or farcy might be supposed to exist. The work was still progressing, 89 stables and 599 horses having been examined, one case of glanders only having been found. The names and location of the stables, the conditions in regard to repair, cleanliness and ventilation, the condition and apparent care of the horses, and the names of owners, were reported and recorded.

At the same meeting, the committee "To consider the expediency of establishing a hospital for diseased horses," reported "that circumstances, so far as known, did not seem at the present time to demand such an institution, but desired time for further inquiry and consideration," and was continued.

The Secretary also reported upon several matters of reference and work, which will be presented in another place.

At a meeting held on WEDNESDAY, NOV. 5, 1879, the Board voted to adopt an official seal.

It having been made known that Dr. King proposed to pass the ensuing winter in Europe, it was also moved and passed, "That David King, M. D., Chairman, be, and he is hereby appointed the accredited delegate of the Rhode Island State Board of Health to any similar organization, in any city or country in Europe."

At each of the meetings there was more or less of routine business, the regular reports of the Secretary in relation to work in the department of diseases among domestic animals, complaints of nuisances, prevailing diseases, etc., which it is needless to mention here, but of which some part will be reported elsewhere.

## BY-LAWS.

No very important change has been made in the By-Laws during the year, and they stand as follows:

SECTION 1. This body shall be known as the Rhode Island State Board of Health.

SEC. 2. The officers of the Board shall consist of a Chairman, Secretary and Auditor, to be chosen annually at the meeting in July.

SEC. 3. The duties of the chairman shall be, to preside at the meetings of the Board, to put all votes, to decide questions of order, and to appoint all committees when not otherwise voted by the Board. He shall certify all audited bills to the Governor for payment.

SEC. 4. The Secretary shall perform all duties prescribed in the act establishing this Board, shall keep a record of the proceedings, shall do all acts usually incident to the office, and shall notify the members of all regular meetings, and by the advice of the Chairman, shall call all special meetings.

The Secretary shall have an office in the city of Providence, which he shall keep open between the hours of eleven A. M. and one o'clock P. M., upon all business days.

SEC. 5. The Auditor shall examine all bills and vouchers, and if correct shall certify the same to the Chairman of the Board.

SEC. 6. A majority of members shall constitute a quorum to transact business but any member may adjourn.

SEC. 7. The regular meetings of this Board shall be holden at its office in the city of Providence, on the first Wednesday of July, October, January and April, respectively, at such hour as the Board may by vote determine from time to time.

Such of the regulations as have been adopted, from time to time, and have reference to public acts, will be reported when the department of labor to which they have special reference is under consideration.

## DUTIES OF THE BOARD.

Section 3d of the act establishing a State Board of Health, provides as follows:

"The Board shall take cognizance of the interests of life and health among the citizens of the State; they shall make investigations into the causes of disease, and especially of epidemics and endemics among the people, the sources of mortality, and the effects of localities, employments, conditions and circumstances on the public health, and shall faithfully do all in their power to ascertain the causes, and the best means for the prevention of diseases of every kind in the State."

In the discharge of these duties, the questions, in what manner and by what means, the work of investigation could be most effectually prosecuted, were prominently presented and considered. It was seen that to investigate the causes of disease, and especially of epidemics and endemics, the presence and the localities of the diseases must be known; and the conditions and circumstances under which they occurred, ascertained with all possible accuracy. It was also apparent that to obtain a knowledge of the presence and locality of disease, the best mode was the regular registration of prevailing diseases by practicing physicians, and a report of the same *immediately*, in cases of those of a contagious and epidemic character dangerous to life; and of endemic diseases, or diseases peculiar to some localities which were attended with unusual fatality; and weekly or monthly in all other cases.

#### REPORTS OF PREVAILING DISEASES.

In regard to obtaining reports of prevailing diseases, the Secretary obtained the consent of physicians, whose fields of practice covered every section of the State, to report monthly the diseases of most importance prevailing in their respective circuits; the mean degree of severity, approximate ratio of deaths, etc. These reports were wholly voluntary, and although from forgetfulness, and probably in some instances from indifference, the number which continued through the year to make regular reports was reduced nearly one-half, there are still correspondents enough to report from nearly all the towns in the State. But the reports so made do not give any estimate of the number of persons sick with any given disease, nor can either of the correspondents know how many deaths occur outside of their own practice. It is in respect to the mortality of any prevalent disease that another kind of report must be made to supplement the deficiency in the reports of the regular correspondents. That is, the returns of deaths in those localities where the kinds of prevalent diseases and estimated ratio of mortality has already been reported by correspondents, together with various attendant conditions of atmosphere and soil, as to dryness or humidity; the degree and fluctuations of temperature; amount of rainfall, etc. This subject of monthly correspondence will be considered at greater length in another place, under the head of Reports of prevalent Diseases.



## MORTALITY REPORTS.

In regard to mortality reports, they doubtless furnish the most reliable data, and open the way most fully for the successful study of the causes of disease. It has been remarked by the eminent German statistician, Beneke, long in the employ of the Imperial State, that "mortality statistics are the basis of public as well as of private care of health. Every step forward in this direction is a gain to human working power and welfare."

Dr. William Farr, the highest living authority in Vital Statistics and Registration, says: "Deaths and causes of death are scientific facts which admit of numerical analysis. Science has nothing more inviting to offer than a study of the influence of civilization, occupation, locality, seasons and other physical agencies, either in generating disease or producing death, or in improving the public health."

## IMPORTANCE OF ACCURATE RETURNS.

Recognizing the value of complete reports or returns of death, and especially of causes of death, the Secretary has, from the first, labored to secure from those persons whose duty it is to make returns of death and causes of death, the most prompt and efficient discharge of that duty. In the furtherance of this object, it seemed proper that the town councils and town clerks of all the towns in the State should have their attention directed to the importance of correct vital statistics, and the necessity of compliance on the part of the officials and towns people with the Registration laws of the State. The following quotations are from Circular C, sent to the town councils and town clerks early in the year. After calling attention to some other matters not needing repetition here, the circular reads as follows:

"It is expected every town clerk will comply with the law, as provided in Section 1, Chapter 77 of the Revised Statutes, especially when duly certified returns are made 'accompanying the same, *with a list of those individuals, required by law to make returns to him, who have neglected the same.*'"

"It is hardly necessary in this connection, to call your attention to the great value of correct registration, of the births, marriages and deaths in your town. In their civil relations, affording definite evidence as to legal consanguinity, and rights of inheritance or entailments, rights and claims for pensions, insurance, or hereditary annuities. In their social relations, as a record and evidence of the

public spirit, the moral tone and the disposition for associated interest, manifested at different periods of time. In their sanitary relations, though usually less apprehended they are no less important. Indeed, without them sanitary improvement would be greatly impeded. Without a record of births and deaths, the bodily vigor, the relative longevity, the average healthfulness, the tendency to particular diseases in any community, could scarcely be determined."

"By such record, a clue to the laws of life and health is furnished. Such statistics afford the sanitarian standing ground for observing the effects of localities, conditions, employments and circumstances of life, as causations of disease and sources of mortality. But, for *exact conclusions* there *must be correct returns*. False premises lead to defective and deceptive deductions. Incorrect returns lead astray. An investigation of the methods by which the registration returns of this State have been obtained, and an examination and comparison of the returns so obtained, show that in some towns they are very inaccurate. The number of births returned from a town, have been less than the number attended by one practitioner of medicine in the town. Great negligence has also been practised by undertakers and physicians, in regard to the returns of deaths. Attention is called to section 12 of Chapter 77 of the Statutes, with the hope that every town council will require a record of the names of all the classes therein named, and give due notice to the same, that their duties as set forth in Section 4, Section 6 and Section 8 of Chapter 77, must be promptly performed."

"The supply of blank returns of deaths, in the office of the Secretary of State have been exhausted. I have therefore ordered a sufficient number printed for present use, which will soon be ready at this office, for meeting the orders of town clerks and others therefor. In ordering the new blank death returns I have taken occasion to add, on the back of the same, additional sections of the law, in relation to making returns, and also a notice, that the Secretary of the State Board of Health, had been instructed to make complaint of violations of the law. I have also, for greater accuracy and definiteness, particularly in the physician's certificate, added more interrogatories. There is an important end to be gained by full replies to the questions, and it is very desirable that all engaged in filling out the returns, should feel a deep interest in making them as valuable as possible."

The Secretary had previously learned, through replies from the town clerks of the several towns, to Circular B, (which may be found in

the First Annual Report of this Board,) that the undertakers and physicians, as well as other persons having charge of the burial, or other disposition of the remains of deceased persons, had in much the largest number of the towns, made no returns whatever, or if any, they were the exceptions rather than the rule.

Under such a condition of neglect and violation of Statute laws, and consequent carelessness, it could not be otherwise than that the returns of *causes* of death, at least, must be in many instances incorrect. In those towns the returns of deaths are collected by the town clerk or some other authorized person during the months of January and February, in the year succeeding that in which the deaths occurred. It is easy to see how imperfect the collection for the whole preceding year must be.

#### DEATHS OF TRANSIENT PERSONS.

In some cases the decedents are merely visitors or sojourners in the town, and if the facts of the case are not ascertained at the time of death, they can never be afterward. Again, many families in which deaths have occurred, have removed before the end of the year into another town, or out of the State, and therefore no account, or no correct account of such decedents can usually be obtained in the town where the death occurred.

To meet the latter difficulty, in the case of families still living in the State, though not in the town where a death occurred, the Secretary has requested the town clerks to instruct the canvassers as follows:

“The collector should always be instructed to obtain returns of all deaths, which may come to his knowledge, not *previously reported* to the town clerk, and also to obtain information and make returns of deaths not previously reported that occurred in other towns, and in families residing in the town which he is canvassing, at the time the returns are collected, and the said returns should be transmitted *to the town in which the death occurred*. The fees will be the same as in the ordinary returns.”

“Physician’s certificate of *cause* of death should always be obtained when possible.”

“The necessity of exercising great diligence in obtaining correct information in regard to the vital statistics of the towns, should be strongly impressed on the minds of canvassers.”

## POSTAL RETURNS OF DEATHS.

It has been previously stated that the Board, in order to secure more complete returns of deaths, and especially of the *causes* of deaths, had instructed the Secretary to have printed on postal cards, blank returns of death, to be sent to physicians practising in towns where burial or removal permits were not required. The following circular will more fully explain the result desired to be accomplished:

## (CIRCULAR F)

## OFFICE OF SECRETARY OF THE STATE BOARD OF HEALTH,

PROVIDENCE, July 15th, 1879.

DEAR DOCTOR:

You are aware of the difficulty of obtaining accurate returns of deaths and especially of the *causes* of deaths. Physicians many times are not called upon by either the undertaker, person who has charge of a funeral, or the relatives of the decedent for a certificate of the cause of death; nor do either of the parties make return according to law, consequently the proper authorities have no official notice of the occurrence of a death until made next year by the person who collects the returns of births. At that time many families in which a death occurred, will have removed from the town in which such death occurred, and not unfrequently a decedent is simply a visitor or temporary resident of the town in which the death occurred, consequently if a return was not made at the time of the decease, the record of such death will never be made, for the reason that the collector of returns, though having knowledge of the fact of a death, has no parties to apply to, for the purpose of properly filling out the blank interrogatories. And if families do not remove, the remembrance after many months of all the circumstances connected with the sickness and death of an individual are usually very indistinct, and especially with the physician, in whose mind the particulars of cases occurring many months previously, is crowded out by the multitude of other cases following. Therefore the causes of death (which are what the State Board of Health *particularly* desire to know) must in many instances be very imperfectly stated. No time is so favorable for accurate representation of the cause of a death as that immediately following the decease.

The object of the postal cards which accompany this circular, is to obtain from physicians, the filling out by them of the blank certificate, in all cases where they are not called upon by the undertaker or some other person for the usual certificate of cause of death, on or before the second Monday of the month next succeeding the occurrence of the death, and forward the same by mail as addressed on the face.

Care should be taken that the town in which the death occurs should be given, so that when the returns are received in the usual way from the town clerks, the postal returns may be compared with them, and thereby avoid any duplication in the Registration Report.

Please put these postal returns of death in a conspicuous place in your desk, so that your attention will be frequently called to the matter of filling out when circumstances require.

When the last postal return is forwarded, make the sign + in the lower left hand corner on the face of the card, and more will be sent immediately.

By complying with the request above, you will confer a favor on the State Board of Health, and aid materially in the work of investigating the causes of disease.

The Secretary also takes this occasion to request, that you report to the Board for publication, the occurrence of any epidemic, or sickness that attacks any considerable number of persons within your precinct, with all the circumstances of invasion, progress and termination of the same.

You are also desired to prepare a paper, for the same purpose, containing any pertinent facts or suggestions in relation to the cause or prevention of disease, with such comments and conclusions as seem to you reasonable and proper. Papers presenting facts that have come to your knowledge, and your conclusions therefrom, in regard to the communicability of diseases, the origin of infection, by what means conveyed, how long probably dormant, modes of attack, &c., are especially desired.

Also notice of any source of disease, known to you, which is removable, and a statement of the means by which you believe the same may be removed.

Very truly yours,

CHAS. H. FISHER, *Secretary.*

The following is a copy of the form of the blank, printed on the back of the postal cards, the face having the address, Secretary State Board of Health:

### RETURN OF A DEATH

PHYSICIAN'S CERTIFICATE.

In the Town of..... R. I.

1. Name?.....

2. Date of Death?.....187 . Age?.....

3. Disease? Primary.....

4. " Secondary.....

5. Immediate Cause of Death?.....

6. Sanitary Surroundings: Good?.....Bad?.....Average?.....

7. Duration of Disease? Primary.....Secondary.....

.....*Physician.*

N. B.—At No. 2, probable age, if not known exactly. At No. 5, state whether from exhaustion, paralysis, hemorrhage, suffocation, or what. At No. 6, state yes or no to the questions. For out doors make sign, + over reply. For out and in both make sign, --

## INVESTIGATION OF CAUSES OF DISEASE.

It will be noticed in the preceding circular, that physicians to whom the postal card blank returns of death were sent, were not only requested to make returns of death and causes of same, but as in other circulars, were requested to report the occurrence of any epidemic, or sickness that attacked any considerable number of persons in their precinct, with the circumstances of invasion, progress and termination of the same. And as a further means of leading to an investigation of the causes of disease, they were desired to present any facts that had come to their knowledge, in regard to the causes of disease and means of prevention. Some correspondents have reported in relation to the latter request, which will be presented when the subject of causes of death will be more fully considered. How many occurrences of death that were reported through the postal returns during the last half of the year 1879, and were not otherwise returned, can only be known when the full Registration Returns from the towns are all received, and the postal returns compared with them, to discover the number which are duplicated.

## COLLECTION OF VITAL STATISTICS.

It is made one of the duties of the Board through its Secretary, to collect the returns of births, marriages, deaths and divorces, and prepare an annual report upon a registration of the same, by classification and tabulation in condensed form, and in addition thereto, supplementary tables and summaries, presenting comparative results and comments thereon. The preceding remarks in regard to mortality returns, and the measures taken by the Secretary to secure more complete returns of the same, will indicate also the interest felt, in securing reliable returns of all the different classes of events above enumerated. Some portions of circulars sent to town clerks and canvassers, have already been presented, and will show the general tenor of the whole.

The Registration Returns of all the towns in the State, comprising the whole number of births, marriages and deaths, reported as occurring in Rhode Island, in 1878, have been received by the Secretary, and in compliance with the provisions of law, have been tabulated, commented upon and published, as usual in the Rhode Island Registration Reports.

The order in which the tables, comprising the events of 1878 are presented, is the same as found in previous Registration Reports, and the tables of comparative results nearly the same.

A new table may be found on page 51 of the Registration Report, (page 62 of this Report,) showing the number of births, marriages and deaths in each town in the State, during each of the four years, 1875 to 1878, inclusive, with the aggregates of the same; also the *proportions* of the average annual number of these events *to the population* of each town, computed on the basis of the Census of 1875.

The principal object of this table is to present the comparative immunity or liability, as the case may be, of the inhabitants of the several towns, to fatal diseases and causes of death. The other events are brought in, because of their intimate relation to mortuary events, and will be of interest to the average reader. It is not to be understood that these comparisons are more than approximately true, the limitations connected with the number of persons in the different periods of life, having nearly as much to do with the relative mortality, as the salubrity or insalubrity of the locality.

There are a large number of synopses and summaries in the Registration Report, which present the events comprised in Vital Statistics, in a great variety of comparisons with each other, with different periods of time, and with various sections of the State, that are as equally, if not more indispensable, in sanitary investigation, than the results of a single year. For these reasons, and for the reason that such reports usually have a place in the Annual Reports of State and city Boards of Health, and for the further reason that the additional expense will be scarcely more than the cost of the paper on which it is printed, an abridged copy of the Twenty-sixth Registration Report of Rhode Island will be found in the following pages.

# VITAL STATISTICS.

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BIRTHS, MARRIAGES AND DEATHS,

IN

RHODE ISLAND,

FOR THE

YEAR ENDING DECEMBER 31, 1878.



T A B L E I.  
GENERAL ABSTRACT OF BIRTHS, MARRIAGES AND DEATHS,  
IN THE STATE OF RHODE ISLAND DURING THE YEAR  
1878.

TOWNS AND DIVISIONS OF THE STATE.	BIRTHS, 1878.										MARRIAGES, 1878.										DEATHS, 1878.																			
	SEX.					PARENTAGE.					NATIVITY.					SEX.					PARENTAGE.					AGES GIVEN.					Aggregate Age in yrs. in years.					Aggregate Age, in years, of all.				
	Males.		Females.		Whole Number.	American.		Foreign.		Am. male. For. male.	Am. female. For. female.	Whole Number.	Males.		Females.		American.	Foreign.		Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Average Age, in years, of all.										
Barrington.....	1,185	20	12	8	17	2	1	1	5	5	5	11	12	4	23	7	16	20	3	6	16	330	551	55.00	34.44	881	40.04													
Bristol.....	5,829	159	78	81	75	58	17	9	51	24	11	12	4	85	42	43	60	25	42	43	789	1,571	122.88	86.53	2,532	29.79														
Warren.....	4,005	79	51	28	25	44	7	3	48	24	20	2	2	85	38	47	40	45	37	47	789	1,353	21.32	28.78	2,142	35.50														
BRISTOL COUNTY...	11,019	258	141	117	117	104	24	13	104	53	31	14	6	193	87	106	120	73	85	106	2,060	3,475	24.47	32.78	5,555	29.08														
Coventry.....	4,590	91	57	34	47	85	8	1	36	33	3	4	2	80	42	38	65	15	42	38	1,087	1,361	40.16	35.81	3,048	38.10														
East Greenwich....	3,130	52	29	23	30	19	2	1	30	19	4	2	5	40	17	23	33	7	22	19	732	1,109	44.82	46.22	1,971	46.77														
East Greenwich....	1,034	23	14	9	22	15	1	5	7	5	1	1	1	16	9	7	16	10	9	7	253	185	25.89	26.43	418	35.12														
Wick.....	11,614	264	146	188	132	124	15	13	73	43	19	5	6	132	67	85	88	64	67	85	1,917	2,456	28.46	28.68	4,363	26.70														
TOWN.....	20,346	450	246	204	231	178	25	16	146	100	26	8	12	288	135	153	202	86	135	153	4,589	5,111	33.99	33.41	9,700	33.68														
Providence.....	488	9	3	6	7	1	1	1	2	2	2	1	1	4	3	1	4	1	3	1	171	183	57.00	33.00	254	63.50														
Providence.....	1,156	9	2	7	8	1	1	1	10	8	1	1	1	12	4	6	12	4	6	12	222	379	55.50	47.37	601	50.06														
Providence.....	1,074	32	23	9	30	1	1	1	1	1	1	1	1	13	0	7	12	1	6	7	68	323	11.33	40.14	391	30.06														
New Shoreham....	1,147	12	6	6	12	1	1	1	1	1	1	1	1	9	7	2	9	2	434	43	62.00	21.50	477	53.00																
Providence.....	1,863	28	18	10	18	9	1	1	5	5	5	5	5	20	11	9	19	1	11	9	332	51.09	43.55	164	47.70															
Tiverton.....	2,101	67	33	34	47	17	1	2	17	17	17	17	17	18	10	8	16	2	10	8	646	463	60.80	57.75	1,070	56.44														
TOWNS, NEWPORT CO.	7,859	157	85	72	122	27	3	5	85	88	1	1	1	76	41	35	72	4	41	35	2,065	1,682	50.37	46.06	3,747	40.30														
NEWPORT CITY.....	14,028	476	223	253	193	199	41	43	127	78	29	14	11	223	111	112	142	81	110	111	3,467	4,388	31.52	39.53	7,855	35.54														

TOWNS AND DIVISIONS OF THE STATE.	BIRTHS, 1878.					MARRIAGES, 1878.					DEATHS, 1878.										
	SEX.	PARENTAGE.		Whole Number.	NATIVITY.			SEX.	PARENTAGE.		AGES GIVEN.		Aggregate Age in yrs.		Average Age in years.						
		Males.	Females.		American.	Foreign.	Am. male.		For. male.	Am. female.	For. female.	Males.	Females.	Males.	Females.	Males.	Females.	Aggregate Age. In years, of all.	Average Age. In years, of all.		
Burlington.....	5,249	130	69	61	40	63	9	18	12	18	34	18	12	1	3	88	33	2,111	31.88	2,111	31.88
Crandon.....	5,688	148	65	83	58	64	13	13	4	88	51	37	44	44	51	37	1,023	3,883	3,883	37.87	
Cumberland.....	5,673	165	80	79	48	92	12	13	6	87	49	38	50	57	49	38	1,381	2,871	2,871	37.87	
East Providence.....	4,386	168	83	83	93	52	10	11	2	90	37	53	40	41	37	53	1,099	2,871	2,871	37.87	
Foster.....	1,543	22	8	14	22	12	1	2	2	16	5	11	16	7	5	11	16	2,596	28.84	2,596	28.84
Glocester.....	2,098	48	23	25	32	12	1	3	1	38	25	13	31	7	25	13	983	876	876	54.76	
Johnston.....	4,999	135	68	67	84	236	22	24	1	248	103	102	64	144	108	102	2,878	1,811	1,811	47.66	
Lincoln.....	11,565	335	169	166	64	225	22	24	1	2	14	10	4	11	8	10	4	5,510	5,510	5,510	38.98
North Providence.....	1,803	26	15	11	16	9	1	5	3	38	21	17	23	15	21	17	388	2,907	2,907	31.07	
North Smithfield.....	2,797	62	25	37	13	41	5	8	2	71	39	42	60	11	29	41	1,308	1,672	1,672	41.87	
Providence.....	18,464	528	253	275	197	222	53	67	1	832	468	184	157	175	146	183	4,018	9,907	9,907	30.11	
Providence.....	4,101	90	40	40	65	6	4	5	3	71	39	42	60	11	29	41	1,308	2,714	2,714	38.77	
Providence.....	2,857	74	40	34	36	25	8	5	2	30	14	16	21	9	14	16	551	2,023	2,023	34.10	
Providence.....	13,576	404	223	181	103	254	92	25	7	287	141	146	76	211	141	146	4,594	8,096	8,096	38.10	
Prov. Co.....	84,249	2,323	1,167	1,156	867	1,097	172	187	5	683	383	300	84	207	383	300	21,737	43,587	43,587	30.98	
Prov. Co.....	100,675	2,585	1,385	1,200	1,020	1,159	177	228	7	1,016	607	246	87	76	607	246	28,465	51,902	51,902	36.09	
Providence.....	1,054	14	9	5	11	3	1	3	1	15	5	10	15	1	5	10	142	638	638	43.86	
Providence.....	1,855	23	9	14	22	4	4	4	1	17	8	9	16	1	8	9	396	1,701	1,701	48.39	
Providence.....	2,790	63	28	37	53	17	4	6	1	47	30	27	41	6	30	27	696	1,008	1,008	37.33	
Providence.....	3,505	94	42	52	67	17	4	6	1	57	32	43	14	32	32	43	1,136	1,966	1,966	41.41	
Providence.....	4,240	106	52	54	92	5	5	4	3	47	23	24	44	3	23	24	1,067	2,325	2,325	47.84	
Providence.....	1,739	49	18	31	35	9	2	3	1	30	12	18	26	2	12	18	569	1,074	1,074	38.78	
Providence.....	5,408	114	47	67	57	45	5	7	3	46	35	23	36	12	25	23	859	1,730	1,730	38.04	
WASHINGTON CO.....	20,061	465	205	260	337	84	20	24	5	261	135	136	223	38	125	136	5,165	5,887	5,887	41.32	
WASHINGTON CO.....	11,019	258	141	117	117	104	24	13	6	108	87	106	120	73	85	106	2,060	3,475	3,475	24.47	
WASHINGTON CO.....	20,348	450	246	204	231	178	25	16	12	268	135	133	202	86	135	133	5,589	9,700	9,700	38.08	
WASHINGTON CO.....	21,867	633	348	285	315	226	45	48	15	270	132	137	214	85	131	146	5,582	6,070	6,070	38.03	
WASHINGTON CO.....	184,924	4,908	2,502	2,406	1,887	2,266	349	415	130	3,400	1,662	1,738	1,532	1,878	1,660	1,796	45,302	96,489	96,489	28.12	
WASHINGTON CO.....	20,061	465	205	260	337	84	20	24	5	261	135	136	223	38	125	136	5,165	11,023	11,023	42.84	
WASHINGTON CO.....	258,239	6,714	3,402	3,312	2,187	2,848	463	516	165	4,441	2,161	2,280	2,281	2,100	2,156	2,277	62,598	70,890	70,890	30.02	
WASHINGTON CO.....	183,896	30,09	31.11																		

T A B L E I .  
GENERAL ABSTRACT OF BIRTHS, MARRIAGES AND DEATHS,  
IN THE STATE OF RHODE ISLAND DURING THE YEAR  
1878.

TOWNS AND DIVISIONS OF THE STATE.	BIRTHS, 1878.										MARRIAGES, 1878.										DEATHS, 1878.																																							
	SEX.					PARENTAGE.					NATIVITY.					SEX.					PARENTAGE.					AGE <sup>a</sup> Given.					Aggregate Age in yrs. in years.					Aggregate Age, in years, of all.																								
	Whole Number.					American.					Foreign.					Am. male. For. female.					Whole Number.					Males.					Females.					American.					Foreign.					Males.					Females.					Aggregate Age, in years, of all.				
	Males.	Females.				Am. father. For. mother.	Am. father. For. mother.				Am. male. For. female.	Am. male. For. female.				Males.	Females.				Males.	Females.				Males.	Females.				Males.	Females.																												
Barrington.....	1,185	20	12	8	17	2	1	1	5	28	7	16	30	25	3	8	6	16	390	551	55.00	84.44	881	40.04																																				
Bristol.....	5,829	159	78	81	75	58	17	9	51	85	42	43	60	42	43	25	42	43	901	1,571	92.88	96.53	2,532	30.79																																				
Warren.....	4,005	79	51	28	25	44	7	8	48	85	38	47	40	45	37	47	37	47	789	1,353	21.32	28.78	2,142	25.50																																				
BRISTOL COUNTY ..	11,019	258	141	117	117	104	24	13	104	193	87	106	130	73	85	106	85	106	2,040	3,475	24.47	32.78	5,555	29.08																																				
Coxworthy.....	4,590	91	57	34	47	35	8	1	86	80	42	38	65	15	42	38	15	42	98	1,687	1,361	40.16	35.81	3,048	36.10																																			
East Greenwich.....	3,130	52	29	23	30	19	2	1	80	19	9	4	2	5	7	23	7	23	702	1,109	44.82	48.22	1,871	46.77																																				
West Greenwich.....	1,034	23	14	9	23	15	1	1	7	16	9	7	10	1	9	7	10	9	7	233	185	25.80	26.43	418	26.12																																			
Warwick.....	11,614	284	146	138	132	124	15	13	73	152	67	85	88	64	67	85	64	67	1,907	2,456	28.46	28.86	4,363	26.70																																				
KENT COUNTY.....	20,348	450	246	204	231	178	25	16	146	288	135	153	202	86	135	153	86	135	4,589	5,111	33.99	33.41	9,700	33.68																																				
Jamestown.....	488	9	3	6	7	1	1	1	2	4	3	1	4	1	3	1	3	1	171	88	57.00	88.00	254	63.50																																				
Little Compton.....	1,156	9	2	7	8	1	1	1	10	12	4	6	12	4	6	12	4	6	222	379	55.50	47.37	601	50.08																																				
Middletown.....	1,074	32	23	9	30	1	1	1	13	13	6	7	12	1	6	7	12	1	6	68	223	11.33	40.14	391	30.08																																			
New Shoreham.....	1,147	12	6	6	12	1	1	1	5	9	7	2	9	1	7	2	9	1	7	434	43	62.00	21.50	477	58.00																																			
Portsmouth.....	1,883	28	18	10	18	9	1	1	5	20	11	9	19	1	11	9	19	1	11	562	392	51.09	49.55	954	47.70																																			
Tiverton.....	2,101	67	33	34	47	17	1	2	17	18	10	8	16	2	10	8	16	2	10	694	462	60.80	57.75	1,070	56.44																																			
TOWNS, NEWPORT CO.	7,859	157	85	72	122	27	3	5	35	76	41	35	72	4	41	35	72	4	41	2,065	1,692	50.37	46.06	3,747	49.30																																			
NEWPORT CITY.....	14,026	476	223	253	193	199	41	43	127	233	111	112	142	81	110	111	142	81	110	3,407	4,388	81.52	39.53	7,855	35.54																																			



T A B L E I .  
GENERAL ABSTRACT OF BIRTHS, MARRIAGES AND DEATHS,  
IN THE STATE OF RHODE ISLAND DURING THE YEAR  
1878.

TOWNS AND DIVISIONS OF THE STATE.	BIRTHS, 1878.										MARRIAGES, 1878.										DEATHS, 1878.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
	SEX.					PARENTAGE.					NATIVITY.					SEX.					PARENTAGE.					AGES GIVEN.					Aggregate Average Age in yrs. in years.					Aggregate Age, in years, of all.					Average Age, in years, of all.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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	Males.	Females.	American.	Foreign.	Whole Number.	Am. father.	For. father.	Am. mother.	For. mother.	Whole Number.	American.	Foreign.	Am. male.	For. male.	Am. female.	Whole Number.	Males.	Females.	American.	Foreign.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	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Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.

TOWNS AND DIVISIONS OF THE STATE.	BIRTHS, 1878.						MARRIAGES, 1878.						DEATHS, 1878.														
	SEX.		PARENTAGE.		NATIVITY.		SEX.		PARENTAGE.		AGES GIVEN.		AVERAGE AGE In years.		Aggregate Age in yrs.		Average Age In years.		Aggregate Age, in years, of all.								
	Whole Number.		Foreign.	Am. father.	For. mother.	Am. mother.	Foreign.	Am. male.	For. female.	Am. female.	Whole Number.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Aggregate Age, in years, of all.							
	Males.	Females.	American.	Foreign.	For. father.	Am. mother.	Am. male.	For. female.	Am. male.	For. female.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.							
Burrillville.....	5,940	69	61	63	0	13	18	34	18	12	1	66	88	33	44	38	22	44	38	83	1,622	980	37.08	38.94	9,111	31.98	
Cranston.....	2,688	148	55	93	44	13	13	16	8	4	4	88	37	41	41	41	41	41	41	41	1,623	1,770	31.02	40.21	9,883	37.37	
Dunbar.....	5,673	185	96	70	48	02	12	54	10	23	5	6	40	98	30	57	40	190	28.16	38.05	1,861	1,987	32.16	38.05	9,871	37.37	
East Providence.....	4,393	166	88	93	03	10	11	10	16	23	1	2	90	87	53	40	41	1,587	27.27	32.94	1,587	1,587	27.27	32.94	2,966	34.54	
Foster.....	1,535	82	8	14	22	1	1	42	37	1	2	18	5	11	16	11	16	11	16	11	1,946	1,946	38.30	37.37	2,966	34.54	
Gloucester.....	2,068	46	28	22	12	1	8	30	90	1	1	38	95	13	13	7	23	13	13	93	1,632	1,632	38.30	38.96	1,811	47.06	
Johnston.....	4,909	185	68	67	80	22	14	9	10	8	2	46	24	92	92	17	92	17	92	102	2,678	2,678	32.61	32.61	1,425	30.96	
Lincoln.....	11,435	385	180	166	64	295	22	24	37	8	2	308	106	102	64	144	106	64	144	106	2,678	2,678	32.61	32.61	1,425	30.96	
North Providence.....	5,203	96	15	11	16	0	3	9	9	8	14	10	14	10	14	10	14	10	14	10	1,632	1,632	32.61	32.61	1,425	30.96	
North Smithfield.....	2,797	62	25	37	13	41	5	8	16	8	2	9	16	17	882	148	157	175	146	183	4,198	4,198	37.37	43.47	1,872	41.37	
Pawtucket.....	16,446	598	253	275	107	222	52	57	40	98	37	16	17	882	148	157	175	146	183	4,198	4,198	37.37	43.47	1,872	41.37		
Providence.....	4,401	74	40	40	65	6	1	40	98	37	16	17	882	148	157	175	146	183	4,198	4,198	37.37	43.47	1,872	41.37			
Scituate.....	2,857	74	40	34	30	25	8	30	14	5	2	1	14	16	10	10	14	16	10	10	1,581	1,581	47.86	38.10	2,714	38.10	
Smithfield.....	1,739	40	20	34	30	25	8	30	14	5	2	1	14	16	10	10	14	16	10	10	1,581	1,581	47.86	38.10	2,714	38.10	
Woonsocket.....	13,576	404	228	181	103	294	25	25	70	55	7	287	141	146	70	211	141	146	70	211	4,534	4,534	32.15	34.19	8,066	32.15	
TOWNS, PROV. CO....	84,949	2,322	1,167	1,156	867	1,097	172	187	683	363	50	54	1,411	693	718	693	718	693	718	693	21,737	21,737	31.80	31.46	43,587	30.98	
PROVIDENCE CITY...	100,675	2,585	1,385	1,250	1,150	1,177	228	1,016	607	946	87	76	1,980	960	1,020	880	1,020	880	1,020	880	28,437	28,437	34.22	37.88	51,902	36.09	
CHARLESTOWN.....	1,054	14	9	5	11	8	1	7	7	7	15	15	5	10	142	516	28	40	516	28	40	516	28	40	516	28	
Exeter.....	1,355	32	9	14	32	1	1	16	15	1	1	17	9	9	886	425	49	40	473	47	422	881	46	29	881	46	
Hopkinton.....	2,700	43	28	37	53	4	4	11	41	1	1	47	30	27	690	1,008	34	50	37	33	1,704	1,704	36.25	36.25	2,881	40.72	
North Kingstown.....	3,505	94	43	52	67	17	4	6	23	1	1	57	32	25	1,325	1,986	41	41	39	34	2,381	2,381	40.72	40.72	3,505	40.72	
South Kingstown.....	4,240	106	52	54	92	5	5	30	36	1	3	47	38	24	1,136	1,007	50	35	44	46	2,265	2,265	37.84	37.84	3,505	40.72	
Rhineham.....	1,739	49	16	31	35	9	2	15	14	1	2	30	12	18	1,007	1,007	43	38	39	39	1,583	1,583	43.10	43.10	2,714	38.10	
Westerly.....	5,406	114	47	67	57	45	5	7	60	62	3	2	46	25	23	859	671	34	36	37	859	671	34	36	1,780	36.04	
WASHINGTON CO....	20,061	465	205	260	337	64	20	24	207	190	5	7	261	125	136	125	136	125	136	125	5,867	5,867	41.32	43.28	11,069	42.34	
COUNTIES.																											
Bristol.....	11,019	258	141	117	117	104	24	13	104	53	31	14	198	87	108	108	120	73	86	106	2,060	2,060	34.75	34.75	5,565	29.08	
Kent.....	20,846	450	246	304	231	178	25	16	146	100	28	8	296	135	153	153	166	86	135	153	1,589	1,589	33.99	33.99	9,700	33.68	
Newport.....	21,897	683	308	325	315	228	45	48	162	108	25	15	12	268	132	147	214	86	151	146	5,662	5,662	33.99	33.99	11,602	33.68	
Providence.....	184,024	4,908	2,502	2,406	1,987	2,505	349	41	1,699	1,000	402	137	130	3,541	1,878	1,960	1,736	450	1,960	1,736	450	50,287	50,287	33.99	33.99	95,488	38.12
Washington.....	20,061	465	205	260	337	64	20	24	207	190	5	7	261	125	136	125	136	125	136	125	5,867	5,867	41.32	43.28	11,069	42.34	
WHOLE STATE.....	258,239	6,714	3,402	3,312	2,167	2,846	463	516	2,318	1,449	493	181	165	4,441	2,161	2,280	2,281	2,160	2,156	2,277	62,568	62,568	39.02	31.11	133,396	30.09	

TABLE II.—BIRTHS, 1878.

*Arranged by Months, Sexes, and Divisions of the State.*

MONTHS.	SEX.	DIVISIONS OF THE STATE.							
		Whole State.	Bristol County.	Kent County.	Newport County, Towns.	Newport City.	Providence County, Towns.	Providence City.	Washington County.
January....	Males....	293	14	10	7	14	109	127	12
	Females..	236	13	11	3	15	88	88	18
	Total....	529	27	21	10	29	197	215	35
February...	Males....	256	9	18	8	16	90	98	17
	Females..	256	13	21	4	24	81	91	22
	Total....	512	22	39	12	40	171	189	39
March .....	Males....	288	12	24	7	16	108	106	15
	Females..	293	12	18	4	19	101	117	22
	Total....	581	24	42	11	35	209	223	37
April .....	Males....	272	6	21	6	17	86	121	15
	Females..	233	5	12	1	14	83	101	17
	Total....	505	11	33	7	31	169	222	32
May.....	Males....	262	12	19	5	24	89	97	16
	Females..	275	11	30	5	19	94	95	21
	Total....	537	23	49	10	43	183	192	37
June.....	Males....	244	12	20	3	16	79	102	12
	Females..	279	11	20	6	16	100	102	24
	Total....	523	23	40	9	32	179	204	36
July.....	Males....	275	13	21	7	17	92	109	16
	Females..	279	7	15	5	27	106	99	20
	Total....	554	20	36	12	44	198	208	36

TABLE II.—BIRTHS, 1878.—Continued.

MONTHS.	SEX.	DIVISIONS OF THE STATE.							
		Whole State.	Bristol County.	Kent County.	Newport County, Towns.	Newport City.	Providence County, Towns.	Providence City.	Washington County.
August.....	Males....	285	16	29	6	14	86	114	20
	Females..	304	12	17	13	29	95	117	21
	Total....	589	28	46	19	43	181	231	41
September..	Males....	320	10	22	9	18	115	126	20
	Females..	268	5	15	9	17	96	106	20
	Total....	588	15	37	18	35	211	232	40
October....	Males....	284	12	14	8	21	99	109	21
	Females..	294	8	17	9	26	108	106	20
	Total....	578	20	31	17	47	207	215	41
November..	Males....	304	15	25	6	22	104	115	17
	Females..	307	10	14	6	23	107	120	27
	Total....	611	25	39	12	45	211	235	44
December..	Males....	319	10	23	13	28	110	111	24
	Females..	288	10	14	7	24	97	108	28
	Total....	607	20	37	20	52	207	219	52
Whole Year.	Males....	3,402	141	246	85	223	1,167	1,335	205
	Females..	3,312	117	204	72	253	1,156	1,250	260
	Total....	6,714	258	450	157	476	2,323	2,585	465



TABLE III.—MARRIAGES, 1878.

*Arranged by Months and Divisions of the State.*

MONTHS.	Whole State, 1878.	DIVISIONS OF THE STATE.							Whole State, 1877.
		Bristol County.	Kent County.	Newport County, Towns.	Newport City.	Providence County, Towns.	Providence City.	Washington County.	
January.....	197	12	17	4	13	60	76	15	173
February.....	160	3	10	1	11	39	74	22	148
March.....	159	5	13	2	8	46	73	12	116
First Quarter.....	516	20	40	7	32	145	223	49	437
April.....	169	3	18	2	7	46	76	17	206
May.....	192	11	13	5	12	62	68	21	183
June.....	208	8	14	4	5	56	104	17	193
Second Quarter.....	569	22	45	11	24	164	248	55	582
July.....	197	9	12	1	14	59	94	8	176
August.....	152	5	8	....	11	51	62	15	186
September.....	208	8	13	1	15	60	93	18	214
Third Quarter.....	557	22	33	2	40	170	249	41	576
October.....	236	18	12	1	17	72	99	17	214
November.....	258	10	12	10	9	79	115	23	254
December.....	182	12	4	4	5	53	82	22	219
Fourth Quarter.....	676	40	28	15	31	204	296	62	687
Whole Year.....	2,318	104	146	35	127	683	1,016	207	2,282

TABLE IV.—DEATHS, 1878.

*Arranged by Months, Sexes, and Divisions of the State.*

MONTHS.	SEX.	Whole State.	DIVISIONS OF THE STATE.						
			Bristol County.	Kent County.	Newport County, Towns.	Newport City.	Providence County, Towns.	Providence City.	Washington County.
January....	Males....	186	6	15	2	7	50	98	8
	Females..	214	8	13	1	12	59	110	11
	Total....	400	14	28	3	19	109	208	19
February...	Males...	173	7	9	3	9	53	84	8
	Females..	189	9	12	2	13	52	91	10
	Total....	362	16	21	5	22	105	175	18
March.....	Males....	192	10	9	4	15	75	74	5
	Females..	204	9	12	5	11	71	84	12
	Total....	396	19	21	9	26	146	158	17
April.....	Males....	176	6	8	3	9	51	88	11
	Females..	174	9	7	1	9	61	76	11
	Total....	350	15	15	4	18	112	164	22
May.....	Males....	159	6	15	1	8	54	65	10
	Females..	149	6	5	2	4	51	66	15
	Total....	308	12	20	3	12	105	131	25
June.....	Males....	144	4	12	5	9	53	52	9
	Females..	166	12	12	3	9	43	76	11
	Total....	310	16	24	8	18	96	128	20
July.....	Males....	224	11	10	4	9	68	111	11
	Females..	186	5	14	3	11	51	92	10
	Total....	410	16	24	7	20	119	203	21
August.....	Males....	205	10	14	4	9	73	83	12
	Females..	215	7	12	3	13	80	92	8
	Total....	420	17	26	7	22	153	175	20
September..	Males....	167	5	11	3	8	60	70	10
	Females..	178	13	16	4	6	58	72	9
	Total....	345	18	27	7	14	118	142	19
October....	Males....	152	9	9	1	4	38	78	13
	Females..	190	9	12	3	9	60	82	15
	Total....	342	18	21	4	13	98	160	28
November..	Males....	182	5	11	7	8	56	84	11
	Females..	195	10	20	4	6	65	81	9
	Total....	377	15	31	11	14	121	165	20
December..	Males....	201	8	12	4	16	62	82	17
	Females..	220	9	18	4	9	67	98	15
	Total....	421	17	30	8	25	129	180	32
Whole Year.	Males....	2,161	87	135	41	111	693	969	125
	Females..	2,280	106	153	35	112	718	1,020	136
	Total....	4,441	193	288	76	223	1,411	1,989	261

TABLE III.—MARRIAGES, 1878.

*Arranged by Months and Divisions of the State.*

MONTHS.	Whole State, 1878.	DIVISIONS OF THE STATE.							Whole State, 1877.
		Bristol County.	Kent County.	Newport County, Towns.	Newport City.	Providence County, Towns.	Providence City.	Washington County.	
January.....	197	12	17	4	13	60	76	15	173
February.....	160	3	10	1	11	39	74	22	148
March.....	159	5	13	2	8	46	73	12	116
First Quarter.....	516	20	40	7	32	145	223	49	437
April.....	169	3	18	2	7	46	76	17	206
May.....	192	11	13	5	12	62	68	21	183
June.....	208	8	14	4	5	56	104	17	193
Second Quarter.....	569	22	45	11	24	164	248	55	582
July.....	197	9	12	1	14	59	94	8	176
August.....	152	5	8	....	11	51	62	15	186
September.....	208	8	13	1	15	60	93	18	214
Third Quarter.....	557	22	33	2	40	170	249	41	576
October.....	236	18	12	1	17	72	99	17	214
November.....	258	10	12	10	9	79	115	23	254
December.....	182	12	4	4	5	53	82	22	219
Fourth Quarter.....	676	40	28	15	31	204	296	62	687
Whole Year.....	2,318	104	146	35	127	683	1,016	207	2,282

TABLE IV.—DEATHS, 1878.

*Arranged by Months, Sexes, and Divisions of the State.*

MONTHS.	SEX.	DIVISIONS OF THE STATE.							
		Whole State.	Bristol County.	Kent County.	Newport County, Towns.	Newport City.	Providence County, Towns.	Providence City.	Washington County.
January....	Males....	186	6	15	2	7	50	98	8
	Females..	214	8	13	1	12	59	110	11
	Total....	400	14	28	3	19	109	208	19
February...	Males...	173	7	9	3	9	53	84	8
	Females..	189	9	12	2	13	52	91	10
	Total....	362	16	21	5	22	105	175	18
March.....	Males....	192	10	9	4	15	75	74	5
	Females..	204	9	12	5	11	71	84	12
	Total....	396	19	21	9	26	146	158	17
April.....	Males....	176	6	8	3	9	51	88	11
	Females..	174	9	7	1	9	61	76	11
	Total....	350	15	15	4	18	112	164	22
May.....	Males....	159	6	15	1	8	54	65	10
	Females..	149	6	5	2	4	51	66	15
	Total....	308	12	20	3	12	105	131	25
June.....	Males....	144	4	12	5	9	53	52	9
	Females..	166	12	12	3	9	43	76	11
	Total....	310	16	24	8	18	96	128	20
July.....	Males....	224	11	10	4	9	68	111	11
	Females..	186	5	14	3	11	51	92	10
	Total....	410	16	24	7	20	119	203	21
August.....	Males....	205	10	14	4	9	73	83	12
	Females..	215	7	12	3	13	80	92	8
	Total....	420	17	26	7	22	153	175	20
September..	Males....	167	5	11	3	8	60	70	10
	Females..	178	13	16	4	6	58	72	9
	Total....	345	18	27	7	14	118	142	19
October....	Males....	152	9	9	1	4	38	78	13
	Females..	190	9	12	3	9	60	82	15
	Total....	342	18	21	4	13	98	160	28
November..	Males....	182	5	11	7	8	56	84	11
	Females..	195	10	20	4	6	65	81	9
	Total....	377	15	31	11	14	121	165	20
December..	Males....	201	8	12	4	16	62	82	17
	Females..	220	9	18	4	9	67	98	15
	Total....	421	17	30	8	25	129	180	32
Whole Year.	Males....	2,161	87	135	41	111	693	969	125
	Females..	2,280	106	153	35	112	718	1,020	136
	Total....	4,441	193	288	76	223	1,411	1,989	261

TABLE V.—DEATHS, 1878.

*Showing the Number of each Sex, in each Period of Life, in every Town and Division of the State; also the Ratio of Deaths to Population.*

TOWNS AND DIVISIONS OF THE STATE.	POPULATION, 1875.		DEATHS, 1878.				
	Whole Number.	SEX.	Per cent. to Population.	Whole Number.	SEX.	Under 1 year.	1 and under 2 2 and under 3.
Barrington.....	1,185	Males... 572 Females. 613	1.94	23	7 .. 16	1 .. 1 ..	1 .. 1 ..
Bristol.....	5,829	Males... 2,747 Females. 3,082	1.46	85	42 3 43 6	2 5 3 3	
Warren.....	4,005	Males... 1,823 Females. 2,182	2.12	85	38 5 47 4	4 3 4 3	
BRISTOL COUNTY...	11,019	Males... 5,142 Females. 5,877	1.75	193	87 8 106 11	7 8 8 6	
Coventry.....	4,580	Males... 2,173 Females. 2,407	1.75	80	42 6 38 5	1 2 1 3	
East Greenwich.....	3,120	Males... 1,508 Females. 1,612	1.28	40	17 2 23 4	2 .. 1 ..	
West Greenwich....	1,034	Males... 516 Females. 518	1.55	16	9 2 7 1	2 .. 1 ..	
Warwick.....	11,614	Males... 5,683 Females. 5,931	1.31	152	67 12 85 13	3 7 10 2	
KENT COUNTY.....	20,348	Males... 9,880 Females. 10,468	1.42	288	135 22 153 23	8 9 12 6	
Jamestown.....	488	Males... 260 Females. 228	0.82	4	3 .. 1 ..	...	
Little Compton.....	1,156	Males... 556 Females. 600	1.04	12	4 .. 8 ..	1 ..	
Middletown.....	1,074	Males... 542 Females. 532	1.21	13	6 3 7 ..	1 ..	
New Shoreham.....	1,147	Males... 612 Females. 535	0.79	9	7 .. 2 ..	...	
Portsmouth.....	1,893	Males... 988 Females. 905	1.06	20	11 2 9 ..	...	
Tiverton.....	2,101	Males... 1,078 Females. 1,023	0.86	18	10 .. 8 1	...	
TOWNS, NEWPORT CO.	7,859	Males... 4,036 Females. 3,823	0.97	76	41 5 35 1	1 1 2 ..	
NEWPORT CITY.....	14,028	Males... 6,570 Females. 7,458	1.59	223	111 16 112 8	7 4 7 6	

TABLE V.—DEATHS, 1878.—Continued.

3 and under 4.	4 and under 5.	5 and under 10.	10 and under 15.	15 and under 20.	20 and under 30.	30 and under 40.	40 and under 50.	50 and under 60.	60 and under 70.	70 and under 80.	80 and under 90.	90 and over.	Not stated.
...	...	1	3	2	...	2	2	1	2	2	...	...	1
1	1	1	1	2	4	3	5	2	3	7	2	...	...
2	...	2	...	1	4	2	3	5	3	6	2	1	...
3	...	5	1	3	5	1	...	2	1	...	4	...	1
3	1	4	3	1	4	4	4	4	3	2	1	2	...
4	1	6	2	5	9	4	5	5	6	9	6	...	2
5	1	7	6	4	8	8	9	10	6	9	5	3	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...
1	1	2	1	1	3	1	1	4	8	8	2	...	...
1	...	2	...	2	4	6	3	...	1	5	5	...	...
...	...	...	...	...	2	...	1	3	2	4	1	...	...
...	...	...	...	1	1	2	1	2	3	4	4	...	...
...	...	...	...	1	...	2	...	...	1	...	1	...	...
1	...	1	1	...	...	...	...	...	...	2	...	...	...
3	...	3	2	3	5	7	2	5	9	2	4	...	...
4	4	8	1	4	7	2	5	9	8	4	3	1	...
4	1	5	3	5	10	10	4	12	20	14	8	...	...
6	4	11	2	7	12	10	9	11	12	15	12	1	...
...	...	...	...	...	...	1	...	...	1	1	...	...	...
...	...	...	...	...	...	...	...	...	...	...	1	...	...
...	...	...	...	...	...	...	...	1	...	...	2	...	...
...	...	1	...	...	1	2	...	...	1	1	2	...	...
...	1	...	...	...	...	...	...	...	1	...	...	...	...
...	...	...	2	...	1	...	...	4	3	1	...	...	...
...	...	...	...	...	...	...	...	...	1	1	1	...	...
...	...	...	...	...	...	...	1	...	...	...	...	...	...
1	...	1	...	...	...	1	...	...	2	4	1	...	...
1	...	1	...	...	1	...	1	...	...	3	1	...	...
...	...	...	...	1	...	...	...	1	2	2	3	...	...
...	...	...	...	...	...	2	...	...	...	3	2	...	...
1	1	1	...	1	...	2	...	6	7	8	7	...	...
1	...	2	2	...	3	4	2	...	4	8	6	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	4	9	4	3	12	3	12	6	13	6	6	2	1
1	...	12	3	6	5	12	7	6	10	14	11	3	1

TABLE V.—DEATHS, 1878.—Continued.

TOWNS AND DIVISIONS OF THE STATE.	POPULATION, 1875.		DEATHS, 1878.					
	Whole Number.	SEX.	Per cent. to Population.	Whole Number.	SEX.	Under 1 year.	1 and under 2.	2 and under 3.
Burrillville.....	5,249	Males... 2,628 Females... 2,621	1.26	66	33 33	3 1 ..		
Cranston.....	5,688	Males... 3,046 Females... 2,642	1.55	88	51 37	6 4 1		
Cumberland.....	5,673	Males... 2,793 Females... 2,880	1.53	87	49 38	9 5 4		
East Providence..	4,336	Males... 2,257 Females... 2,079	2.07	90	37 53	3 3 2		
Foster.....	1,543	Males... 788 Females... 755	1.04	16	5 11	...		
Glocester.....	2,098	Males... 1,086 Females... 1,012	1.81	38	25 13	4 1 ..		
Johnston.....	4,999	Males... 2,522 Females... 2,477	0.92	46	24 22	6 1 2		
Lincoln.....	11,565	Males... 5,563 Females... 6,002	1.80	208	106 102	18 9 3		
North Providence.	1,303	Males... 620 Females... 683	1.07	14	10 4	3 1 ..		
North Smithfield.	2,797	Males... 1,350 Females... 1,447	1.36	38	21 17	2 2 1		
Pawtucket.....	18,464	Males... 8,866 Females... 9,598	1.80	332	148 184	30 19 5		
Scituate.....	4,101	Males... 2,006 Females... 2,095	1.73	71	29 42	3 1 1		
Smithfield.....	2,857	Males... 1,358 Females... 1,499	1.05	30	14 16	2 3 1		
Woonsocket....	13,576	Males... 6,362 Females... 7,214	2.11	287	141 146	43 15 5		
TOWNS, PROV. CO.	84,249	Males... 41,245 Females... 43,004	1.67	1,411	693 718	129 56 34		
PROVIDENCE CITY	100,675	Males... 48,701 Females... 51,974	1.97	1,989	969 1,020	220 83 50		
Charlestown.....	1,054	Males... 534 Females... 520	1.42	15	5 10	1 .. ..		
Exeter.....	1,355	Males... 702 Females... 653	1.26	17	8 9	1 .. ..		
Hopkinton.....	2,760	Males... 1,344 Females... 1,416	1.70	47	20 27	2 1 1		
North Kingstown.	3,505	Males... 1,705 Females... 1,800	1.63	57	32 25	3 .. ..		
South Kingstown.	4,240	Males... 2,111 Females... 2,129	1.11	47	23 24	1 1 ..		
Richmond.....	1,739	Males... 845 Females... 894	1.72	30	12 18	2 .. ..		
Westerly.....	5,408	Males... 2,745 Females... 2,663	0.89	48	25 23	6 1 3		
WASHINGTON CO.	20,061	Males... 9,986 Females... 10,075	1.30	261	125 136	12 4 5		

TABLE V.—DEATHS, 1878.—Continued.

3 and under 4.	4 and under 5.	5 and under 10.	10 and under 15.	15 and under 20.	20 and under 30.	30 and under 40.	40 and under 50.	50 and under 60.	60 and under 70.	70 and under 80.	80 and under 90.	90 and over.	Not stated.
....	....	3	3	1	6	2	1	4	4	3	1	1	....
1	....	3	3	3	3	6	3	....	1	1	2	1	....
....	3	2	1	....	7	10	4	3	4	2	4	....	....
....	....	1	1	....	3	4	2	4	2	9	4	....	....
....	....	3	1	1	2	7	4	5	2	5	1	....	....
1	1	5	2	1	1	2	1	2	4	3	2	....	....
1	4	2	2	....	1	3	1	6	3	3	1	....	....
3	1	4	2	1	4	8	3	4	6	3	2	....	....
....	....	....	....	....	2	....	....	2	....	....	1	....	....
....	....	....	....	....	1	1	....	2	2	3	1	....	....
....	1	....	1	....	1	4	2	3	4	2	2	....	....
....	....	....	....	1	....	1	....	3	1	3	4	....	....
....	....	....	....	2	2	1	1	2	1	5	1	....	....
2	....	2	....	....	2	2	1	2	1	2	....	....	....
10	5	5	3	6	5	3	5	11	8	10	5	....	....
3	....	9	5	3	9	4	4	12	5	5	6	....	....
1	....	....	....	1	1	1	....	....	....	1	1	....	....
1	....	1	....	1	....	....	....	....	....	....	....	....	....
....	1	1	....	1	3	....	1	1	3	4	1	....	....
....	....	....	....	4	4	....	....	2	....	2	2	1	....
6	5	6	2	1	13	4	14	11	11	13	6	....	2
5	....	8	1	7	28	12	15	15	12	11	16	....	1
....	....	1	....	2	5	1	2	2	1	4	5	1	....
1	....	5	....	2	5	4	....	3	2	7	2	1	1
....	....	....	....	....	1	....	2	....	3	2	1	....	....
....	....	2	....	....	....	....	2	3	2	1	....	....	....
3	....	4	2	4	12	6	7	13	8	12	7	2	....
1	1	6	4	11	18	11	14	5	10	9	2	....	....
21	19	27	15	19	61	42	44	63	52	66	37	4	2
18	3	46	18	34	78	55	45	57	48	59	43	3	2
37	35	70	28	19	78	63	59	75	73	54	20	5	....
36	35	68	24	44	91	99	70	70	53	87	33	10	....
....	....	1	....	....	1	....	1	....	1	....	....	....	....
....	....	....	....	1	1	....	2	....	2	2	....	1	....
1	....	1	....	....	....	1	1	....	1	3	....	....	....
....	....	1	....	....	....	1	1	2	1	....	2	....	....
....	1	1	1	....	4	1	1	1	2	4	....	....	....
....	....	....	2	3	2	2	4	2	2	1	....	3	....
....	....	2	1	....	3	3	5	1	6	5	1	....	....
....	....	3	1	1	5	1	....	4	3	5	....	....	....
....	....	1	....	2	....	3	2	2	3	5	3	....	....
....	1	....	1	1	4	1	....	1	5	3	3	1	....
1	....	....	1	....	1	....	....	....	1	3	3	....	....
....	....	....	....	....	1	3	....	2	1	2	6	1	....
....	....	2	....	....	3	3	....	3	4	1	2	....	....
....	1	1	1	1	3	....	2	2	1	1	5	1	....
2	1	8	3	2	12	11	10	7	18	21	9	....	....
....	2	5	5	7	16	8	9	13	15	14	16	7	....



TABLE V.—DEATHS, 1878.—RECAPITULATION BY COUNTIES.

COUNTIES.	POPULATION, 1875.			DEATHS, 1878.					
	Whole Number.	SEX.		Per cent. to Population.	Whole Number.	SEX.	Under 1 year.	1 and under 2.	2 and under 3.
BRISTOL Co. . .	11,019	Males . .	5,142	1.75	193	87	8	7	8
		Females	5,877			106	11	8	6
KENT Co. . . .	20,348	Males . .	9,888	1.42	288	135	22	8	9
		Females	10,468			153	23	12	6
NEWPORT Co. .	21,887	Males . .	10,606	1.37	299	152	21	8	5
		Females	11,281			147	9	9	6
PROV. Co. . . .	184,924	Males . .	89,946	1.83	3,400	1,662	349	148	77
		Females	94,978			1,738	272	147	90
WASH. Co. . . .	20,061	Males . .	9,986	1.30	261	125	12	4	5
		Females	10,075			136	13	5	1
WHOLE STATE.	258,239	Males . .	125,560	1.72	4,441	2,161	412	175	104
		Females	132,679			2,280	328	181	109

TABLE V.—DEATHS, 1878.—RECAPITULATION BY COUNTIES.

3 and under 4.	4 and under 5.	5 and under 10.	10 and under 15.	15 and under 20.	20 and under 30.	30 and under 40.	40 and under 50.	50 and under 60.	60 and under 70.	70 and under 80.	80 and under 90.	90 and over.	Not stated.
4	1	6	2	5	9	4	5	5	6	9	6	....	2
5	1	7	6	4	8	8	9	10	6	9	5	3	....
4	1	5	3	5	10	10	4	12	20	14	8	....	....
6	4	11	2	7	12	10	9	11	12	15	12	1	....
4	5	10	4	4	12	5	12	12	20	14	13	2	1
2	....	14	5	6	8	16	9	6	14	22	17	3	1
58	54	97	43	38	139	105	103	138	125	120	57	9	2
54	38	114	42	78	169	154	115	127	101	146	76	13	2
2	1	8	3	2	12	11	10	7	18	21	9	....	....
....	2	5	5	7	16	8	9	13	15	14	16	7	....
72	62	126	55	54	182	135	134	174	189	178	93	11	5
67	45	151	60	102	213	196	151	167	148	206	126	27	3

TABLE VI.—CAUSES OF DEATH, 1878.

*Arranged Alphabetically; showing the Number of each Sex, who died from each cause, in each Month and in the whole year 1878; also the Number of American and of Foreign Parentage, from each cause, for the year.*

CAUSES OF DEATH.	PARENTAGE.												SEX.				
	Am. For. Total.																
	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	M. F.	Total.			
Accidents (various).....	14	27	41	6	2	4	2	1	1	1	1	2	5	3	30	11	41
“ Burns and Scalds.....	6	5	11	1	2	1	2	1	1	1	1	1	1	1	4	7	11
“ Drowning.....	16	28	44	5	2	1	2	2	4	8	1	5	2	1	1	35	44
“ Falls.....	6	7	13	1	1	1	1	1	1	1	1	1	1	1	2	8	13
“ Poisoning.....	5	1	6	2	1	1	1	1	1	1	1	1	1	1	5	1	6
“ Railroad.....	3	4	7	1	1	1	1	1	1	1	1	1	1	1	7	1	7
Abscesses.....	6	7	13	1	2	1	1	1	1	1	1	2	1	1	8	5	13
Anæmia.....	1	1	2	1	1	1	1	1	1	1	1	1	1	1	2	2	2
Aneurism.....	2	4	6	1	1	1	1	1	1	1	1	1	1	1	4	2	6
Apoplexy.....	79	23	102	7	3	3	6	8	4	3	8	5	4	2	4	59	102
Asthma.....	4	4	8	1	1	1	1	2	1	2	1	1	1	1	3	5	8
Bladder, Disease of.....	2	1	3	1	1	1	1	1	1	1	1	1	1	1	2	2	2
“ Gravel and Calculus.....	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Bowels, Disease of.....	1	3	4	1	1	1	1	1	1	1	1	1	1	1	2	2	4
Brain, Disease of.....	25	13	38	2	2	2	3	1	2	3	5	2	1	1	26	12	38
“ Congestion of.....	12	8	20	1	1	1	1	1	1	1	1	2	2	3	4	7	20
“ Inflammation of.....	36	45	81	3	4	5	5	1	4	5	3	7	1	4	2	42	81
Bronchitis.....	37	43	80	3	7	4	8	6	4	3	5	1	3	2	4	30	80
Cancer (various).....	52	23	75	3	4	1	3	4	5	6	2	4	3	2	4	28	75
“ of Breast.....	6	5	11	1	1	1	1	1	1	1	1	1	1	2	11	11	11
“ of Stomach.....	10	5	15	1	1	1	2	1	1	1	1	1	1	1	10	5	15

CAUSES OF DEATH.	PARENTAGE.												SEX.																									
	Jan.			Feb.			Mar.			Apr.			May.			June.			July.			Aug.			Sept.			Oct.			Nov.			Dec.			Total.	
	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.					
Cancer of Uterus.....	11	7	18	2	1	3	1	1	2	1	4	2	2	4	2	1	3	1	1	2	1	3	2	1	3	2	5	2	1	3	1	1	18	18				
Cancerum Ovis.....	1	1	2	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1					
Chicken Pox.....	1	1	2	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1					
Child-birth.....	6	9	15	1	1	2	1	2	1	1	1	1	2	3	1	2	2	3	1	2	1	3	2	1	3	2	5	2	1	3	15	15						
“ Puerperal Convulsions.	8	3	11	1	1	2	1	2	1	1	1	1	5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	11	11						
“ Puerperal Fever.....	9	8	17	2	4	6	2	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	17	17						
Cholera Infantum.....	73	95	168	1	1	2	1	1	1	1	4	2	3	3	0	2	2	1	8	4	6	2	2	1	1	9	6	7	2	168	168							
“ Morbus.....	1	5	6	1	1	2	1	1	1	1	2	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	6	6						
Colic.....	7	5	12	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12	12						
Consumption.....	296	380	676	17	43	20	32	30	35	24	26	32	42	33	29	23	20	26	39	26	32	18	24	22	31	25	37	296	380	676	676	676						
Convulsions.....	46	66	112	5	5	9	5	4	6	3	2	1	2	6	8	4	9	4	5	5	3	2	4	6	5	4	63	49	112	112	112							
Croup.....	43	50	93	6	7	6	6	4	4	5	1	1	2	1	2	1	3	1	1	1	7	4	7	7	13	45	48	93	93	93	93	93						
Debility.....	28	41	69	2	5	2	2	2	1	5	3	2	2	3	4	3	5	7	1	2	1	2	6	5	1	3	33	36	69	69	69							
“ Birth Premature.....	8	4	12	1	1	2	1	1	3	2	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	9	3	12	12	12							
Diabetes.....	3	1	4	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	4	4	4							
Diarrhoea.....	19	21	40	1	1	2	1	1	1	1	1	1	1	1	5	6	10	3	2	1	3	4	1	2	1	22	18	40	40	40	40							
“ Chronic.....	7	6	13	2	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	6	7	13	13	13	13							
Diphtheria.....	201	234	435	29	35	17	13	29	21	21	19	18	9	13	21	8	5	11	14	12	11	26	21	27	21	13	21	224	211	435	435	435						
Dropsy.....	23	15	38	1	1	1	1	2	2	1	1	2	1	2	1	2	2	4	3	1	1	3	1	3	3	21	17	38	38	38	38	38						
“ of Chest.....	3	3	6	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	4	6	6	6	6							
Dysentery.....	21	14	35	1	1	1	1	1	1	2	1	1	1	1	3	4	2	7	4	2	1	1	1	1	1	12	23	35	35	35	35							
“ Typhoid.....	4	1	5	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	2	3	5	5	5	5							
Enteritis.....	17	23	40	4	2	6	2	4	1	3	1	1	1	1	1	1	7	2	5	1	3	2	2	2	2	16	24	40	40	40	40							
Epilepsy.....	6	2	8	1	2	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	5	3	8	8	8	8							
Erysipelas.....	11	4	15	1	1	2	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	8	7	15	15	15	15							
Exposure to cold.....	1	1	2	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
Fever.....	6	4	10	1	1	2	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	5	5	10	10	10	10							

TABLE VI.—CAUSES OF DEATH, 1878.—Continued.

CAUSES OF DEATH.	PERCENTAGE.												SEX.											
	Am.						Total.						M.						F.					
	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Fever Bilious.....	2	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
" Remittent.....	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
" Typhoid.....	65	69	134	3	1	3	1	3	10	7	13	9	61	73	134	1	2	3	3	1	1	1	1	1
" Gastric.....	3	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Gallstones.....	2	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Gangrene.....	6	3	9	...	...	...	...	...	...	...	...	...	3	6	9	...	...	...	...	...	...	...	...	...
Glossitis.....	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Heart, Diseases of.....	107	54	161	10	1	7	5	6	9	8	5	6	87	74	161	1	4	5	4	5	4	5	4	5
" Hypertrophy of.....	2	3	5	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Heat.....	2	2	4	...	...	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...
Hemorrhage.....	5	10	15	1	...	...	...	...	...	...	...	...	3	12	15	1	3	6	9	2	2	...	...	...
" from Lungs.....	4	5	9	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...
" from Stomach.....	1	1	2	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Hernia.....	4	3	7	...	...	...	...	...	...	...	...	...	2	5	7	...	...	...	...	...	...	...	...	...
Hip-Joint, Disease of.....	...	3	3	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Hooping Cough.....	30	24	54	2	2	3	2	1	2	1	...	...	26	28	54	1	2	1	3	1	2	1	2	1
Hydrocephalus.....	34	36	70	2	4	1	2	4	1	5	3	6	39	31	70	1	2	1	3	1	1	2	1	2
Hydrophobia.....	1	2	3	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...
Insanity.....	16	6	22	...	...	...	...	...	...	...	...	...	5	17	22	...	...	...	...	...	...	...	...	...
Intussusception.....	1	2	3	...	...	...	...	...	...	...	...	...	2	1	3	...	...	...	...	...	...	...	...	...
Intemperance.....	2	9	11	...	...	...	...	...	...	...	...	...	7	4	11	...	...	...	...	...	...	...	...	...
" Delirium Tremens.....	2	1	3	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...
" Opium Eating.....	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jaundice.....	1	1	2	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...

CAUSES OF DEATH.		PERCENTAGE.												SEX.											
		Am.	For.	Total.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	M.	F.	Total.	M.	F.	Total.			
Kidneys, Disease of.....	14	12	26	...	1	1	...	3	...	2	1	...	2	...	2	...	2	1	23	3	26				
“ Bright's Disease of.	35	19	54	4	2	2	1	4	5	3	3	...	1	5	3	3	2	1	4	...	3				
Laryngitis.....	2	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	2				
Lightning Stroke.....	1	1	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	2				
Liver, Disease of.....	28	12	40	3	...	...	...	1	2	2	1	3	1	3	2	6	3	1	1	2	2				
“ Inflammation of.....	1	4	5	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	2	1	3				
Lungs, Disease of.....	8	7	15	1	1	...	...	3	1	...	...	...	...	...	...	...	...	2	1	1					
Malformations, (all kinds)...	17	15	32	3	1	4	4	1	1	1	4	1	...	2	2	2	1	1	1	1					
Marasmus.....	21	34	55	1	2	2	2	2	4	2	3	1	1	1	5	4	4	4	1	1					
Measles.....	25	56	81	2	10	16	15	9	9	3	2	4	1	1	2	1	3	1	1	1					
Meningitis Cerebro-Spinal.	6	5	11	...	1	1	1	1	...	...	...	...	...	2	...	1	1	1	1	1					
“ Spinal.....	3	...	3	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	3	3					
Murder and Homicide.....	3	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...					
Neuralgia.....	1	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1					
Neglect.....	1	2	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	2					
Old Age.....	172	50	222	5	9	7	13	8	14	10	16	9	10	5	6	4	7	7	10	6					
Paralysis.....	66	20	86	2	7	3	2	7	6	2	4	3	2	4	5	2	...	8	1	2					
Peritonitis.....	12	10	22	1	1	1	1	...	3	1	1	1	2	2	1	1	...	1	...	1					
Pleurisy.....	1	1	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1					
Pneumonia.....	148	121	269	18	23	18	20	22	16	12	16	5	12	3	5	2	7	3	4	6					
“ Congestion of Lungs	28	20	48	3	4	3	5	2	1	3	5	2	1	...	3	1	1	2	1	1					
Prostate, Disease of.....	4	...	4	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...					
Purpura Hemorrhagica.....	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...					
Pyæmia.....	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...					
Quinsy.....	3	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...					
Rheumatism.....	9	7	16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...					
Scarlatina.....	35	51	86	5	1	1	2	2	1	2	1	1	4	...	6	10	4	1	5	3					

TABLE VI.—CAUSES OF DEATH, 1878.—Continued.

CAUSES OF DEATH.	PARENTAGE.												SEX.																							
	Jan.			Feb.			Mar.			Apr.			May.			June.			July.			Aug.			Sept.			Oct.			Nov.			Dec.		
	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.			
Fever Bilious.....	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...			
“ Remittent.....	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...			
“ Typhoid.....	65	69	134	3	3	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...			
“ Gastric.....	3	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...			
Gallstones.....	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...			
Gangrene.....	6	3	9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...			
Glossitis.....	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...			
Heart, Diseases of.....	107	54	161	10	1	7	5	6	9	8	5	6	6	10	7	4	5	6	3	9	4	...	...	...	...	...	...	...	...	...	...	...	...			
“ Hypertrophy of.....	2	3	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...			
Heat.....	2	2	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...			
Hemorrhage.....	5	10	15	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...			
“ from Lungs.....	4	5	9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...			
“ from Stomach.....	1	1	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...			
Hernia.....	4	3	7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...			
Hip-Joint, Disease of.....	...	3	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...			
Hooping Cough.....	30	24	54	2	2	3	2	1	2	1	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...			
Hydrocephalus.....	34	36	70	2	4	1	2	4	1	5	3	6	6	4	2	7	3	4	2	3	3	1	1	1	2	1	2	1	2	3	3	...	...			
Hydrophobia.....	1	2	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...			
Insanity.....	16	6	22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...			
Intussusception.....	1	2	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...			
Intemperance.....	2	9	11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...			
“ Delirium Tremens.....	2	1	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...			
“ Opium Eating.....	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...			
Jaundice.....	1	1	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...			

CAUSES OF DEATH.	PARENTAGE.												SEX.											
	Am. For. Total.												M. F. M											



TABLE VI.—CAUSES OF DEATH, 1878.—Continued.

CAUSES OF DEATH.		PARENTAGE.												SEX.											
		Am.	For.	Total.	M.	F.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	M.	F.	Total.				
Scrofula.....	9	4	13	2	1	1	1	1	1	2	1	1	1	1	1	1	1	1	5	8	13				
Septicæmia.....	2	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	3				
Skin, Disease of.....	4	1	5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	2	5				
Spleen, Disease of.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1				
Spine, Disease of.....	3	4	7	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	5	2	7				
Stomach, Disease of.....	5	5	10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	8	10				
“ Inflammation of.....	4	10	14	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	7	7	14				
Suicide.....	12	9	21	2	1	1	1	1	1	1	1	4	1	2	1	1	3	1	16	5	21				
Surgical Operations.....	2	1	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	2				
Syphilis.....	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2				
“ Congenital.....	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2				
Tabes Mesenterica.....	2	4	6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2				
Teething.....	4	12	16	1	1	1	1	2	2	1	1	1	1	3	1	1	1	1	4	2	6				
Tetanus and Tris. Nascent.....	4	4	8	1	1	1	1	1	1	1	1	5	1	1	1	1	1	1	11	5	16				
Tetanus.....	2	2	4	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	6	2	8				
Thrush.....	13	14	27	1	1	1	1	1	2	1	1	2	1	1	1	1	1	3	1	4	27				
Tuberculosis.....	11	10	21	1	1	1	1	2	2	1	1	2	1	1	3	1	2	1	2	19	21				
Tumor.....	2	2	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2				
Ulcer.....	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2				
Uremia.....	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2				
Uterus, Disease of.....	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2				
Worms.....	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2				
Unknown.....	77	131	208	6	5	9	11	10	9	11	6	9	3	4	6	14	7	6	14	10	103				
“ Sudden.....	2	2	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2				

TABLE VII.—CAUSES OF DEATH, 1878.

*Arranged Alphabetically; showing the Number of each Sex, who died from each cause, in each Period of Life.*

CAUSES OF DEATH.	Under 1 and 2.										Age not stated.										SEX.								
	1.		2.		5.		10.		15.		20.		30.		40.		50.		60.		70.		80.		90.		Total.		
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	Total.
Accidents (various).....	3	5	2	2	2	2	1	1	2	3	1	5	5	1	4	3	2	2	1	1	30	11	41						
“ Burns and Scalds.....			3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	7	11						
“ Drowning.....			1	8	1	6	4	2	2	2	2	2	2	2	2	2	2	2	2	2	35	9	44						
“ Falls.....			1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	8	5	13						
“ Poisoning.....			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	5	1	6						
“ Railroad.....																					7	7	14						
Abscesses.....	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	8	5	13						
Anæmia.....																													
Aneurism.....																													
Apoplexy.....																													
Asthma.....																													
Bladder, Disease of.....																													
“ Gravel and Calculus.....																													
Bowels, Disease of.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1						
Brain, Disease of.....			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	26	12	38						
“ Congestion of.....	1	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	7	13	20						
“ Inflammation of.....	10	9	5	8	9	4	3	1	2	2	1	1	1	1	1	1	1	1	1	1	42	39	81						
Bronchitis.....	17	11	2	10	2	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	30	50	80						
Cancer (various).....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	28	47	75						
“ of Breast.....																													
“ of Stomach.....																													

TABLE VI.—CAUSES OF DEATH, 1878.—Continued.

PARENTAGE.				Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	SEX.		
				Am.	For.	Total.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
Scrofula.....	9	4	13	2	1	1	1	1	2	1		1	1	1	1	5	8	13
Septicæmia.....	2	1	3	1								1			1	2	1	3
Skin, Disease of.....	4	1	5	1		1		1					1	1		3	2	5
Spleen, Disease of.....	1	1	1										1			1	1	1
Spine, Disease of.....	3	4	7	1	1			2	1			1		1	1	5	2	7
Stomach, Disease of.....	5	5	10	1	1				1	1				3	1	1	2	8
“ Inflammation of.....	4	10	14	1	1		2	2	1	1		1	1	1	2	7	7	14
Suicide.....	12	9	21	2	1	1	1	1	1	4	1	2	1	1	3	16	5	21
Surgical Operations.....	2	1	3							1				1	1	1	1	3
Syphilis.....	2		2			1								1				
“ Congenital.....	1	1	2							1				1	1	1	1	2
Tabes Mesenterica.....	2	4	6						1	1			1	1	1	4	2	6
Teething.....	4	12	16	1	1			2		5		3	1	1	1	11	5	16
Tetanus and Tris. Nascen.....	4	4	8		1	1	1	1	1		1			1	1	6	2	8
Thrush.....	2	2	4		1		2		1							3	1	4
Tuberculosis.....	13	14	27	1	1	1	2	1	1	2	3	1	1	1	2	14	13	27
Tumor.....	11	10	21	1	1	1	2	2	1	2	1	2	1	3	2	2	19	21
Ulcer.....	2	2	4						1				1				2	2
Uterina.....	1		1						1				1		1	1	1	1
Uterus, Disease of.....	1	1	2						1									
Worms.....	1	1	2		1										1		2	2
Unknown.....	77	131	208	6	5	9	11	10	9	3	4	6	14	7	10	105	103	208
“ Sudden.....	2		2				1				1						2	2



TABLE VI.—CAUSES OF DEATH, 1878.—Continued.

CAUSES OF DEATH.		PARENTAGE.												SEX.												
		Am.	For.	Total.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	M.	F.	M.	F.	M.	F.	M.	F.	Total.	
Scrofula.....	9	4	13	2	1	1	1	1	2	1	1	1	1	1	1	1	5	8	13							
Septicæmia.....	2	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	3							
Skin, Disease of.....	4	1	5	1	1	1	1	1	1	1	1	1	1	1	1	1	3	2	5							
Spleen, Disease of.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1							
Spine, Disease of.....	3	4	7	1	1	1	1	2	1	1	1	1	1	1	1	1	5	2	7							
Stomach, Disease of.....	5	5	10	1	1	1	1	1	1	1	1	1	1	1	1	1	2	8	10							
“ Inflammation of.....	4	10	14	1	1	2	2	1	1	1	1	1	1	1	1	1	7	7	14							
Suicide.....	12	9	21	2	1	1	1	1	1	4	1	2	1	1	3	1	16	5	21							
Surgical Operations.....	2	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	3							
Syphilis.....	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2							
“ Congenital.....	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2							
Tabes Mesenterica.....	2	4	6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2							
Teething.....	4	12	16	1	1	1	2	1	1	5	3	1	1	1	1	1	11	5	16							
Tetanus and Tris. Nascent.....	4	4	8	1	1	1	1	1	1	1	1	1	1	1	1	1	6	2	8							
Thrush.....	2	2	4	1	1	1	2	1	1	1	1	1	1	1	1	1	3	1	4							
Tuberculosis.....	13	14	27	1	1	1	2	1	1	2	3	1	1	1	2	2	14	13	27							
Tumor.....	11	10	21	1	1	1	2	2	1	2	2	1	1	3	2	1	2	19	21							
Ulcer.....	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2							
Uremia.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1							
Uterus, Disease of.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1							
Worms.....	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2							
Unknown.....	77	131	208	6	5	9	11	6	9	3	4	6	14	7	6	14	105	103	208							
“ Sudden.....	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2							

TABLE VII.—CAUSES OF DEATH, 1878.

*Arranged Alphabetically; showing the Number of each Sex, who died from each cause, in each Period of Life.*

CAUSES OF DEATH.	1 and under 2.		2 to 5.		5 to 10.		10 to 15.		15 to 20.		20 to 30.		30 to 40.		40 to 50.		50 to 60.		60 to 70.		70 to 80.		80 and over.		Age not stated.		SEX.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
Accidents (various).....	3	5	2	...	1	1	2	...	3	1	5	...	5	1	4	...	3	2	2	...	1	...	30	11	41			
“ Burns and Scalds.	...	3	1	1	1	...	1	1	1	...	1	...	1	...	1	...	...	2	...	2	...	4	7	11				
“ Drowning.....	...	1	8	1	6	4	2	7	2	4	2	2	2	...	2	...	...	1	...	1	...	35	9	44				
“ Falls.....	...	1	1	1	1	1	...	1	1	1	1	...	2	1	...	...	1	1	1	...	8	5	13					
“ Poisoning.....	...	1	...	...	...	...	...	...	...	1	...	1	...	...	...	...	...	4	...	...	...	5	1	6				
“ Railroad.....	...	...	...	...	...	...	...	1	1	1	1	1	...	1	...	...	1	1	1	...	7	...	7					
Abscesses.....	1	1	1	1	...	...	1	1	2	1	1	...	1	...	...	...	...	1	...	1	...	8	5	13				
Anæmia.....	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	2	2					
Aneurism.....	...	...	...	...	...	...	1	2	1	...	1	...	1	...	...	...	1	...	1	...	4	2	6					
Apoplexy.....	...	...	1	...	...	...	1	1	1	1	1	7	3	12	9	14	7	16	16	8	5	1	59	43	102			
Asthma.....	...	...	...	...	...	...	...	...	...	...	1	1	1	1	1	1	1	1	1	2	...	3	5	8				
Bladder, Disease of.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	1	...	2	2				
“ Gravel and Calculus.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	1	1	1				
Bowels, Disease of.....	1	...	1	1	...	...	...	...	...	...	1	1	1	1	1	...	...	...	...	...	2	2	4					
Brain, Disease of.....	1	1	1	...	1	2	...	...	...	1	3	1	2	1	3	2	6	4	1	4	...	26	12	38				
“ Congestion of.....	1	3	2	1	1	...	...	3	...	2	...	1	2	1	1	2	...	...	...	...	7	13	20					
“ Inflammation of.....	10	9	5	8	9	4	3	1	2	2	1	1	3	1	2	3	4	1	1	...	42	39	81					
Bronchitis.....	17	11	2	10	2	3	2	1	1	1	1	1	1	1	2	2	1	7	3	5	3	4	30	50	80			
Cancer (various).....	1	...	1	...	...	...	...	...	...	1	1	2	5	3	7	6	16	9	7	5	6	2	28	47	75			
“ of Breast.....	...	...	...	...	...	...	...	...	...	...	...	3	6	...	...	1	...	1	...	...	11	11	11					
“ of Stomach.....	...	...	...	...	...	...	...	...	...	...	1	1	1	2	1	6	1	1	1	...	10	5	15					

TABLE VII.—CAUSES OF DEATH, 1878.—Continued.

CAUSES OF DEATH.	Under 1.			1 and under 2.			2 to 5.			5 to 10.			10 to 15.			15 to 20.			20 to 30.			30 to 40.			40 to 50.			50 to 60.			60 to 70.			70 to 80.			80 and over.			Age not stated.			SEX.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
Cancer of Uterus.....																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	





TABLE VII.—CAUSES OF DEATH, 1878.—Continued.

CAUSES OF DEATH.	Under 1.		1 and under 2.		2 to 5.		5 to 10.		10 to 15.		15 to 20.		20 to 30.		30 to 40.		40 to 50.		50 to 60.		60 to 70.		70 to 80.		80 and over.		Age not stated.		SEX.				
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	Total.		
Cancer of Uterus.....																1				4	9	3		1						18	18		
Cancerum Oris.....	1																												1	1			
Chicken Pox.....	1																													1	1		
Child-birth.....																															15	15	
“ Puerperal Convulsions.....																															11	11	
“ Puerperal Fever.....																															17	17	
Cholera Infantum.....	73	49	17	17	6	6																								96	72	168	
“ Morbus.....																														4	2	6	
Colic.....	1																													9	3	12	
Consumption.....	3	6	6	2	2		3	5	3	11	21	48	98	116	54	85	33	45	29	27	18	14	15	3	2				296	380	676		
Convulsions.....	31	25	14	15	14	6	2	2	1																					63	49	112	
Croup.....	5	6	12	9	17	23	9	10	2																					45	48	93	
Debility.....	28	28	1	2			1	1																							33	36	69
“ Birth Premature.....	9	3																												9	3	12	4
Diabetes.....																														1	3	4	
Diarrhoea.....	13	9	3	4			1																							22	18	40	
“ Chronic.....																														6	7	13	
Diphtheria.....	12	6	40	29	104	76	49	75	14	19	1	2			1	2														224	211	435	
Dropsy.....	1																													21	17	38	
“ of Chest.....																														2	4	6	
Dysentery.....	2	2	3	4	2	2	1																							12	23	35	
“ Typhoid.....																														2	3	5	

CAUSES OF DEATH.																															
Under 1.		1 and under 2.		2 to 5.		5 to 10.		10 to 15.		15 to 20.		20 to 30.		30 to 40.		40 to 50.		50 to 60.		60 to 70.		70 to 80.		80 and over.		Age not stated.		SEX.			
M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	Total.	
3	7	..	..	3	1	..	2	1	..	3	1	1	2	1	1	3	1	3	2	..	3	1	..	..	..	16	24	40			
Epilepsy	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	1	2	..	1	1	..	..	..	..	..	5	3	8			
Erysipelas	1	1	..	..	..	..	..	1	..	..	..	..	..	1	1	2	3	..	2	1	2	..	..	..	..	8	7	15			
Exposure to cold	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1	..	1	..	1	
Fever	1	..	..	..	..	1	..	1	..	2	..	1	1	1	1	1	1	..	..	..	..	..	..	..	..	5	5	10			
“ Bilious	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	1	1	2	..	1	
“ Remittent	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	
“ Typhoid	..	..	1	2	5	6	7	8	..	7	18	25	22	5	4	4	5	6	1	1	1	..	2	..	..	61	73	134			
“ Gastric	..	..	1	..	..	..	..	..	..	..	..	..	..	..	2	1	..	..	..	..	1	..	..	..	..	1	2	3	..	3	
Gangrene	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	2	1	..	..	3	6	9	..	9	
Gallstones	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	1	1	2	..	2
Glossitis	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1	..	1	..	1	
Heart, Diseases of	2	1	..	1	1	1	2	2	5	3	4	4	13	9	7	15	10	20	15	24	10	5	6	..	..	87	74	161			
“ Hypertrophy of	..	..	..	..	..	..	1	..	..	..	..	..	1	1	..	1	..	1	..	1	..	1	..	..	..	1	4	5	..	4	
Heat	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	2	..	..	..	..	..	4	..	4	..	4	
Hemorrhage	1	3	..	..	..	1	..	..	..	..	2	1	2	2	..	2	..	1	2	..	1	2	..	1	..	3	12	15	..	15	
“ from Lungs	..	..	..	..	..	1	..	..	1	1	1	1	..	..	2	..	1	1	1	1	1	1	..	..	..	3	6	9	..	9	
“ from Stomach	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	1	..	1	..	..	..	..	..	..	..	2	..	2	..	2	
Hernia	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	1	..	4	1	..	..	..	..	..	..	2	5	7	..	7	
Hip-Joint, Disease of	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	..	2	1	3	..	3	
Hooping Cough	17	8	6	9	3	9	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	26	28	54	..	54	
Hydrocephalus	14	10	15	8	9	6	1	6	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	39	31	70	..	70	
Hydrophobia	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	3	..	3	..	3	
Insanity	..	..	..	..	..	..	..	..	..	..	1	2	1	2	1	1	4	1	3	..	3	2	..	..	..	5	17	22	..	22	
Intemperance	..	..	..	..	..	..	..	..	..	..	1	2	1	2	1	1	5	1	1	1	1	1	..	..	..	7	4	11	..	11	

TABLE VII.—CAUSES OF DEATH, 1878.—Continued.

CAUSES OF DEATH.	Under 1.		1 and under 2.		2 to 5.		5 to 10.		10 to 15.		15 to 20.		20 to 30.		30 to 40.		40 to 50.		50 to 60.		60 to 70.		70 to 80.		80 and over.		Age not stated.		SEX.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	Total.	
Cancer of Uterus.....																1		4		9		3		1					18	18
Cancer of Oris.....	1																											1		1
Chicken Pox.....	1																												1	1
Child-birth.....												1		6		6		2											15	15
“ Puerperal Convulsions												2		6		3													11	11
“ Puerperal Fever.....												1		6		8		2											17	17
Cholera Infantum.....	73	49	17	17	6	6																					96	72	168	
“ Morbus.....						1										1	1	1	1	1	1	1					4	2	6	6
Colic.....	1					1									2		1	1	2		1	3					9	3	12	9
Consumption.....	3	6	2	2	3	5	3	11	21	48	98	116	54	85	33	45	29	27	27	18	14	15	3	2			296	380	676	
Convulsions.....	31	25	14	15	14	6	2	2	1		1									1							63	49	112	
Croup.....	5	6	12	9	17	23	9	10	2																		45	48	93	
Debility.....	28	28	1	2		1		1											2	4	2						33	36	69	
“ Birth Premature.....	9	3																									9	3	12	
Diabetes.....																1		1		1							1	3	4	
Diarrhoea.....	13	9	3	4		1					2					1	2	1		1	1	1					22	18	40	
“ Chronic.....																1	1	1	2	2							6	7	13	
Diphtheria.....	12	6	40	29	104	76	49	75	14	19	1	2			1	2	1	2	1								224	211	435	
Dropsy.....	1						3	1								2	3	5	2	4	6	5	2	1	1		21	17	38	
“ of Chest.....																	1	1	1	1							2	4	6	
Dysentery.....	2	2	3	4	2	2	1																				12	23	35	
“ Typhoid.....			1			2							1														2	3	5	

## CAUSES OF DEATH.

CAUSES OF DEATH.	Under 1.		1 and under 2.		3 to 5.		5 to 10.		10 to 15.		15 to 20.		20 to 30.		30 to 40.		40 to 50.		50 to 60.		60 to 70.		70 to 80.		80 and over.		Age not stated.		SEX.		Total.
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
Enteritis.....	3	7			3	1	2	1			3	1	1	2	1	1	1	3	1	3	2			3	1			16	24	40	
Epilepsy.....									1				1				1	1	2		1	1					5	3	8		
Erysipelas.....	1	1					1						1		1	1		2	3		2		1	2			8	7	15		
Exposure to cold.....																											1	1	1	1	1
Fever.....	1					1				1	2				1	1	1	1	1							5	5	10			
“ Bilious.....													1	1	1	1											1	1	1	2	
“ Remittent.....																															
“ Typhoid.....					1	2	5	6	7	8	7	18	25	22	5	4	4	5	6	1	1	1	1	2		61	73	134			
“ Gastric.....																1										1	2	3	1	1	1
Gangrene.....	1															2	1									3	6	9			
Gallstones.....																											1	1	1	2	
Glossitis.....																															
Heart, Diseases of.....	2	1			1	1	1	2	2	5	3	4	13	9	7	15	10	20	15	24	10	5	6			87	74	161			
“ Hypertrophy of.....												1	1					1	1	1	1	1				1	4	5	1	4	5
Heat.....							1											1		2						4	1	4	1	4	1
Hemorrhage.....	1	3											2	1	2	2		1	2		1	2				3	12	15			
“ from Lungs.....						1					1	1	1		2		1	1	1							3	6	9			
“ from Stomach.....													1				1									2	2	2	2	2	2
Hernia.....																											2	5	7	7	5
Hip-Joint, Disease of.....						1										1		1								2	1	3	1	3	1
Hooping Cough.....	17	8	6	9	3	9	2																			26	28	54			
Hydrocephalus.....	14	10	15	8	9	6	1	6																		39	31	70			
Hydrophobia.....									2																	3	1	3	1	3	1
Insanity.....																											5	17	22		
Intemperance.....																											7	4	11		

TABLE VII.—CAUSES OF DEATH, 1878.—Continued.

CAUSES OF DEATH.																														
Under 1.		1 and under 2.		2 to 5.		5 to 10.		10 to 15.		15 to 20.		20 to 30.		30 to 40.		40 to 50.		50 to 60.		60 to 70.		70 to 80.		80 and over.		Age not stated.		SEX.		
M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	Total.
Intemperance, Delir. Tremens																														
" Opium Eating																														
Intussusception																														
Jaundice																														
Kidneys, Disease of																														
" Bright's Disease of.																														
Laryngitis																														
Lightning Stroke																														
Liver, Disease of																														
" Inflammation of																														
Lungs, Disease of																														
Malformations, (all kinds)																														
Marasmus																														
Measles																														
Meningitis Cerebro-Spinal.																														
" Spinal																														
Murder and Homicide																														
Neuralgia																														
Neglect																														
Old Age																														
Paralysis																														
Peritonitis																														

CAUSES OF DEATH.	Under 1 and under 5.		5 to 10.		10 to 15.		15 to 20.		20 to 30.		30 to 40.		40 to 50.		50 to 60.		60 to 70.		70 to 80.		80 and over.		Age not stated.		SEX.		Total.		
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.			
Pleurisy.....																													
Pneumonia.....	24	23	11	10	9	16	3	2	1	2	6	3	3	8	7	9	16	10	7	18	20	12	26	5	8	125	144	269	
“ Congestion of Lungs.	7	10	2	2	1	3	1						1	1	2	1		1	3							18	30	48	
Prostate, Disease of.....																											4		
Purpura Hemorrhagica.....	1																												
Pyæmia.....																													
Quinsy.....																													
Rheumatism.....																													
Scarlatina.....	3	4	8	9	14	16	15	11	1	3	1		1	1	2	2	1									9	7	16	
Scrofula.....	2	1	1	1	1																						41	45	86
Septicæmia.....																											5	8	13
Skin, Disease of.....	1	2	1																								2	1	3
Spleen, Disease of.....																											3	2	5
Spine, Disease of.....	1	1																											
Stomach, Disease of.....																													
“ Inflammation of.....																													
Suicide.....																													
Surgical Operations.....																													
Syphilis.....																													
“ Congenital.....	1	1																									1	1	2
Tabes Mesenterica.....	2		2	1																							4	2	6
Teething.....	9	2	2	3																							11	5	16
Tetanus and Tris. Nascen.	5	2																									6	2	8
Thrush.....	3	1																									3	1	4
Tuberculosis.....	3	4																									14	13	27

TABLE VII.—CAUSES OF DEATH, 1878.—Continued.

CAUSES OF DEATH.	Under 1.		1 and under 2.		2 to 5.		5 to 10.		10 to 15.		15 to 20.		20 to 30.		30 to 40.		40 to 50.		50 to 60.		60 to 70.		70 to 80.		80 and over.		Age not stated.		SEX.		Total.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.		
Intemperance, Delir. Tremens																			2		1								3		3	
“ Opium Eating															1															1	1	
Intussusception			1																1	1									2	1	3	
Jaundice																					1									1	2	
Kidneys, Disease of	1		1		1		2				1	2	1	1					6		1	1	7	2					23	3	26	
“ Bright's Disease of.											1	4	4	5	5				6	6	4	5	3	1					27	27	54	
Laryngitis			1																1											2	2	
Lightning Stroke													2																	2	2	
Liver, Disease of	1										1	1	2	1	4	3			5	3	3	4	3	6	2	1			21	19	40	
“ Inflammation of.			1												1	1					1	1	1	1					2	3	5	
Lungs, Disease of	2		1										2	1	1				2	1	1	1	3						6	9	15	
Malformations, (all kinds)	20	10	2																											22	10	32
Marasmus	22	20	3	5	1	1							1										2						28	27	55	
Measles	9	12	10	8	18	8	3	1	1				1	1														39	42	81		
Meningitis Cerebro-Spinal.			1				1	1	2	1	1				2	1												6	5	11		
“ Spinal			1						1																					3	3	3
Murder and Homicide	1												1						1										3		3	
Neuralgia			1																											1	1	2
Neglect			2																1											84	138	222
Old Age																					2	2	30	43	52	93						
Paralysis	1						1						1	3	2	2			7	13	15	4	11	10	5	8			45	41	86	
Peritonitis	2	1			1					1	1	1	1	2	1	3	1		2	1	2	1	3	2					10	12	22	

## CAUSES OF DEATH.

CAUSES OF DEATH.	Under 1.		1 and under 2.		2 to 5.		5 to 10.		10 to 15.		15 to 30.		30 to 40.		40 to 50.		50 to 60.		60 to 70.		70 to 80.		80 and over.		SEX.		Total.		
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.			
Pleurisy.....																										1	1	2	
Pneumonia.....	24	23	11	10	9	16	3	2	1	2	6	3	3	8	7	9	16	10	7	18	20	12	26	5	8	125	144	269	
“ Congestion of Lungs.	7	10	2	2	1	1	3	1			1	1	2	1	2	2	1	1	3	7					18	30	48		
Prostate, Disease of.....																			1	1	2				4		4		
Purpura Hemorrhagica.....	1																									1	1	2	
Pyæmia.....																			1							1	1	2	
Quinsy.....																			1							1	2	3	
Rheumatism.....																			1	1	2	2	1	1		9	7	16	
Scarlatina.....	3	4	8	9	14	16	15	11	1	3	1	1	1	1	1	1	1	1							41	45	86		
Scrofula.....	2	1	1	1	1						2	2	1						1						5	8	13		
Septicæmia.....																			1	1						2	1	3	
Skin, Disease of.....	1	2	1																1							3	2	5	
Spleen, Disease of.....																												1	1
Spine, Disease of.....	1	1									1	1	1													5	2	7	
Stomach, Disease of.....																			1	1	1	1	2			2	8	10	
“ Inflammation of.....																			2	1	1	2	1	3	1	7	7	14	
Suicide.....											1		6	1	4	1	1	1	1		1				16	5	21		
Surgical Operations.....																			1	2							3	3	3
Syphilis.....																			1							1	1	2	
“ Congenital.....	1	1																	1	1						1	1	2	
Tabes Mesenterica.....	2		2	1														1								4	2	6	
Teething.....	9	2	2	3																						11	5	16	
Tetanus and Tris. Nascen.	5	2																	1							6	2	8	
Thrush.....	3	1																								3	1	4	
Tuberculosis.....	3	4																	2	2	4	2	2	1		14	13	27	



TABLE VII.—CAUSES OF DEATH, 1878.—Continued.

CAUSES OF DEATH.	Under 1.		1 and under 2.		2 to 5.		5 to 10.		10 to 15.		15 to 20.		20 to 30.		30 to 40.		40 to 50.		50 to 60.		60 to 70.		70 to 80.		80 and over.		Age not stated.		SEX.		Total.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.		
Tumor.....	1												1		3		4		5		5		2							2	19	21
Ulcer.....																			1		1									2	2	
Uremia.....													1																	1	1	
Uterus, Disease of.....													1																	1	1	
Worms.....																														2	2	
Unknown.....	44	35	6	12	8	10	5	4	2	1	1	4	3	7	2	7	6	4	5	2	7	8	9	3	4	5	3	1	105	103	208	
“ Sudden.....																			1		1								2		2	

TABLE VIII.—CLASSIFICATION AND PERCENTAGE, 1878.

*Showing what part of the Mortality in the whole State, and in each Division, is ascribed to each cause, and class of causes.*

NUMBER OF DEATHS IN EACH DIVISION OF THE STATE.							PERCENTAGE OF DEATHS IN EACH DIVISION.						
CAUSES OF DEATH.							Percentage in the Whole State.						
Whole State.							Washington County.	Providence City.	Providence County.	Newport City.	Newport County, Towns.	Kent County.	Bristol County.
Kent County.	Newport County, Towns.	Newport City.	Providence County, Towns.	Providence City.	Washington County.	Whole State.							
193 288	76 223	1 411	1 989	261	4 441	All Causes.	100.00	100.00	100.00	100.00	100.00	100.00	100.00
187 249	74 191	1 308	1 973	249	4 231	Specified Causes.	100.00	100.00	100.00	100.00	100.00	100.00	100.00
66 83	12 39	354	621	47	1 222	I. ZYMOTIC DISEASES.	28.88	18.88	31.48	27.07	20.42	16.22	33.33
SPORADIC DISEASES.													
13 27	6 16	147	196	28	433	II. GENERAL OR NOT LOCALIZED	10.23	11.25	9.93	11.24	8.38	8.10	10.84
24 37	17 29	165	258	24	554	III. NERVOUS SYSTEM	13.09	9.63	13.08	12.61	15.18	22.98	14.86
37 56	13 48	375	511	78	1 118	IV. RESPIRATORY SYSTEM	26.42	31.33	25.90	28.67	25.13	17.57	22.49
5 11	6 9	39	87	15	172	V. CIRCULATORY SYSTEM	4.07	6.02	4.41	2.98	4.71	8.10	4.42
13 10	4 13	51	86	10	187	VI. DIGESTIVE SYSTEM	4.42	4.02	4.36	3.90	6.81	5.41	4.02
4 3	1 3	27	51	3	92	VII. URINARY SYSTEM	2.17	1.21	2.58	2.06	1.57	1.35	1.21
2 2	1 1	6	13	2	27	VIII. GENERATIVE SYSTEM	.64	.80	.66	.46	.52	1.35	.80
1 2	1 1	8	12	1	26	IX. LOCOMOTIVE SYSTEM	.62	.40	.61	.61	.52	1.35	.80
.....	2	.....	3	2	7	X. INTEGUMENTIVE SYSTEM	.17	.80	.15	.....	1.05	.....	.....
15 8	9 23	76	61	30	222	XI. OLD AGE	5.25	12.04	3.09	5.81	12.04	12.16	3.21
7 10	4 7	60	74	9	171	XII. EXTERNAL CAUSES	4.04	3.62	3.75	4.59	3.67	5.41	4.02

TABLE VIII.—CLASSIFICATION AND PERCENTAGE, 1878.—Continued.

NUMBER OF DEATHS IN EACH DIVISION OF THE STATE.							PERCENTAGE OF DEATHS IN EACH DIVISION.									
Bristol County.	Kent County.	Newport County, Towns.	Newport City.	Providence County, Towns.	Providence City.	Washington County.	Whole State.	CAUSES OF DEATH.	Percentage in the Whole State.	Washington County.	Providence City.	Providence County, Towns.	Newport City.	Newport County, Towns.	Kent County.	Bristol County.
I. ZYMOTIC DISEASES.																
1	1	1	6	64	71	5	1	Chicken Pox	.02	.....	.....	.....	.....	.....	.....	.....
7	14	1	1	4	2	5	168	Cholera Infantum	3.97	2.01	3.60	4.89	3.14	1.35	5.62	3.74
14	3	7	25	4	2	5	6	" Morbus	.14	.....	.10	.30	.....	.....	.....	.....
3	3	2	17	28	39	5	93	Croup	2.20	2.01	1.98	1.91	3.67	.....	1.21	7.49
21	29	3	20	106	245	11	53	Diarrhea	1.25	.....	1.42	1.30	1.05	.....	1.21	1.60
2	5	17	11	17	11	5	435	Diphtheria	10.28	4.42	12.42	8.11	10.47	4.05	11.64	11.23
2	2	1	4	7	7	1	40	Dysentery	.95	2.01	.56	1.30	.....	.....	2.01	1.07
2	2	1	4	7	7	1	15	Erysipelas	.35	.40	.36	.30	.52	.....	.80	.....
2	2	7	7	7	1	1	10	Fever	.24	.40	.....	.53	.....	.....	.80	.....
1	1	1	1	1	1	1	2	" Bilious	.05	.....	.....	.08	.....	1.35	.....	.....
1	1	1	1	1	1	1	3	" Gastric	.07	.....	.....	.08	.....	1.35	.....	.54
2	2	1	3	3	9	2	17	" Puerperal	.40	.80	.46	.23	.....	1.35	.80	.....
1	1	1	1	1	1	1	1	" Remittent	.02	.40	.....	.....	.....	.....	.....	.....
12	11	2	2	50	47	10	134	" Typhoid and Typhus	3.16	4.02	2.38	3.82	1.05	2.70	4.42	6.42
1	1	9	9	43	43	1	54	Hooping Cough	1.28	.40	2.18	.68	.....	.....	.40	.....
1	1	1	1	1	1	1	3	Hydrophobia	.07	.40	.05	.08	.....	.....	.....	.....
2	3	26	26	50	50	50	81	Measles	1.91	.....	2.53	1.99	.....	.....	1.21	1.07



TABLE VIII.—CLASSIFICATION AND PERCENTAGE, 1878.—Continued.

NUMBER OF DEATHS IN EACH DIVISION OF THE STATE.						PERCENTAGE OF DEATHS IN EACH DIVISION.						
CAUSES OF DEATH.						Percentage in the Whole State.						
I. ZYMOTIC DISEASES.												
Bristol County.	Kent County.	Newport County, Towns.	Newport City.	Providence County, Towns.	Providence City.	Washington County.	Providence City.	Providence County, Towns.	Newport City.	Newport County, Towns.	Kent County.	Bristol County.
1	14	1	6	64	71	5	1	168	1	1	1	1
7	14	1	6	64	71	5	1	168	1	1	1	1
14	3	7	25	39	5	6	14	3	97	2	1	1
3	3	2	17	28	1	53	2	20	2	1	1	1
21	29	3	20	106	245	11	1	435	1	1	1	1
2	5	17	11	5	40	1	1	40	1	1	1	1
2	2	4	7	1	15	1	1	15	1	1	1	1
2	2	7	1	1	10	1	1	10	1	1	1	1
1	1	1	1	1	2	1	1	2	1	1	1	1
1	1	1	1	1	3	1	1	3	1	1	1	1
2	1	3	9	2	17	1	1	17	1	1	1	1
12	11	2	2	50	47	10	1	134	1	1	1	1
1	1	9	43	1	54	1	1	54	1	1	1	1
2	3	1	1	1	3	1	1	3	1	1	1	1
2	3	26	50	1	81	1	1	81	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1					



TABLE VIII.—CLASSIFICATION AND PERCENTAGE, 1878.—Continued.

NUMBER OF DEATHS IN EACH DIVISION OF THE STATE.							PERCENTAGE OF DEATHS IN EACH DIVISION.								
Bristol County.	Kent County.	Newport County, Towns.	Newport City.	Providence County, Towns.	Providence City.	Washington County.	Percentage in the Whole State.	CAUSES OF DEATH.							
								I. ZYMOTIC DISEASES.							
1	1						.02	1 Chicken Pox.....	2.01	3.60	4.89	3.14	1.35	.40	
7	14	1	6	64	71	5	3.97	168 Cholera Infantum.....	2.01	1.98	1.91	3.67	1.35	5.62	3.74
				4	2		.14	6 “ Morbus.....		10	.30				
14	3	7	25	25	39	5	2.20	93 Croup.....	2.01	1.98	1.91	3.67	1.35	1.21	7.49
3	3	2	17	28	28		1.25	53 Diarrhea.....		1.42	1.30	1.05		1.21	1.60
21	29	3	20	106	245	11	10.28	435 Diphtheria.....	4.42	12.42	8.11	10.47	4.05	11.64	11.23
2	5		1	17	11	5	.95	40 Dysentery.....	2.01	.56	1.30			2.01	1.07
	2		1	4	7	1	.35	15 Erysipelas.....	.40	.36	.30	.52		.80	
	2		7	7		1	.24	10 Fever.....	.40		.53			.80	
		1	1	1			.05	2 “ Bilious.....			.08		1.35		
	1	1	1	1			.07	3 “ Gastric.....			.08		1.35		.54
	2	1		3	9	2	.40	17 “ Puerperal.....	.80	.46	.23		1.35	.80	
						1	.02	1 “ Remittent.....	.40						
12	11	2	2	50	47	10	3.16	134 “ Typhoid and Typhus.....	4.02	2.38	3.82	1.05	2.70	4.42	6.42
	1			9	43	1	1.28	54 Hooping Cough.....	.40	2.18	.68			.40	
				1	1	1	.07	3 Hydrophobia.....	.40	.05	.08				
2	3			26	50		1.91	81 Measles.....		2.53	1.99			1.21	1.07

11	1	1	1	7	11	Meningitis, Cerebro-Spinal.	.26	.....	.36	.08	.52	.....	.40	.54
2	1	1	1	1	2	Pyæmia	.05	.....	.05	.08	.....	.....	.....	.....
86	5	3	14	4	86	Scarlatina	2.03	1.61	2.89	1.07	.....	4.05	2.01	1.60
3	1	1	1	2	3	Septicæmia	.07	.....	.10	.08	.....	.....	.....	.....
4	1	1	1	1	4	Syphilis	.09	.....	.05	.15	.....	.....	.40	.....
Totals							28.88	18.88	31.48	27.07	20.42	16.22	33.33	35.29
II. GENERAL OR NOT LOCALIZED.														
13	1	1	1	6	13	Abscesses	.31	.....	.30	.23	.....	.....	.80	1.07
2	1	1	1	1	2	Anæmia	.05	.....	.....	.08	.52	.....	.....	.....
119	2	6	37	48	119	Cancer	2.82	4.02	2.43	2.83	3.14	2.70	4.42	2.67
1	1	1	1	1	1	Cancerum Oris	.02	.....	.....	.....	.52	.....	.....	.....
81	3	3	38	36	81	Debility	1.91	1.21	1.83	2.91	1.57	.....	.....	.....
38	5	2	18	11	38	Dropsy	.90	4.42	.....	1.38	.52	2.70	2.01	.54
9	1	1	4	2	9	Gangrene	.21	.40	.10	.30	.....	1.35	.40	.....
17	1	1	8	8	17	Hæmorrhage	.40	.....	.41	.61	.....	.....	.40	.....
32	1	1	7	22	32	Malformation	.76	.....	1.12	.53	.52	1.35	.40	.....
55	3	1	10	39	55	Marasmus	1.30	.40	1.98	.77	1.05	.....	.....	1.60
1	1	1	1	1	1	Purpura Hemorrhagica	.02	.....	.....	.08	.....	.....	.....	.....
13	1	1	4	7	13	Scrofula	.31	.40	.36	.30	.52	.....	.....	.....
4	1	1	3	1	4	Thrush	.09	.....	.05	.23	.....	.....	.....	.....
27	4	1	6	17	27	Tuberculosis	.64	.....	.86	.46	.....	.....	1.61	.....
21	2	1	7	10	21	Tumors	.50	.40	.51	.53	.....	.....	.40	1.07
Totals							10.23	11.25	9.93	11.24	8.38	8.10	10.84	6.95
III. NERVOUS SYSTEM.														
102	2	6	5	31	102	Apoplexy	2.41	4.42	2.13	2.37	2.62	6.76	2.41	1.07
20	2	1	9	7	20	Brain, Congestion of	.47	.40	.36	.68	.52	.....	.80	.....
38	3	1	17	16	38	" Diseases of	.90	.....	.81	1.30	.52	1.35	1.21	.....



TABLE VIII.—CLASSIFICATION AND PERCENTAGE, 1878.—Continued.

NUMBER OF DEATHS IN EACH DIVISION OF THE STATE.						PERCENTAGE OF DEATHS IN EACH DIVISION.							
CAUSES OF DEATH.						Percentage in the							
Whole State.						Washington County.	Providence City.	Providence County.	Newport City.	Newport County.	Kent County.	Bristol County.	
81 Brain, Inflammation of. . . . .						1.91	.40	2.28	1.45	3.67	1.35	2.81	.54
112 Convulsions. . . . .						2.65	1.61	2.94	2.52	1.57	4.05	2.41	2.67
3 Delirium Tremens. . . . .						.07	. . .	.10	.08	. . .	. . .	. . .	. . .
8 Epilepsy. . . . .						.19	.40	.30	.08	. . .	. . .	. . .	. . .
70 Hydrocephalus. . . . .						1.65	. . .	1.98	1.53	1.57	. . .	.80	3.21
22 Insanity. . . . .						.52	.40	.86	.23	.52	. . .	. . .	. . .
3 Meningitis, Spinal. . . . .						.07	.40	. . .	. . .	.52	. . .	.40	. . .
1 Neuralgia. . . . .						.02	. . .	. . .	.08	. . .	. . .	. . .	. . .
86 Paralysis. . . . .						2.04	1.61	1.22	2.06	3.14	6.76	4.02	5.35
8 Tetanus and Tris. Nascitum. . . . .						.19	. . .	.10	.23	.52	2.70	. . .	. . .
Totals. . . . .						13.09	9.63	13.08	12.61	15.18	22.98	14.86	12.84
IV. RESPIRATORY SYSTEM.													
8 Asthma. . . . .						.19	.40	.15	.15	. . .	. . .	.80	. . .
80 Bronchitis. . . . .						1.89	.40	2.43	1.68	3.14	. . .	.80	.54
676 Consumption. . . . .						15.98	18.88	15.46	17.51	10.99	13.51	16.47	12.30
6 Dropsy of Chest. . . . .						.14	.40	. . .	.08	.52	. . .	. . .	1.60
Totals. . . . .						554	258	24	165	29	24	165	24
Kent County.						1	7	1	7	1	7	1	7
Newport County.						5	6	3	3	3	3	3	3
Newport City.						. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Providence County.						. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Providence City.						. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Washington County.						. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Whole State.						81	45	1	19	45	1	19	45
Totals.						554	258	24	165	29	24	165	24

2	1	6	9 Hemorrhage from Lungs.	.21	.30	.08	1.05	.....	.....	.....	.....
1	1	1	2 Laryngitis	.05	.05	.08	.....	.....	.....	.....	.....
8	7	7	15 Lungs, Diseases of	.35	.36	.61	.....	.....	.....	.....	.....
1	1	1	2 Pleurisy	.05	.05	.08	.....	.....	.....	.....	.....
8	118	24	269 Pneumonia	6.36	9.63	7.19	6.28	2.70	4.42	4.28	.....
2	16	22	48 " Congestion of Lungs	1.13	1.61	1.22	1.57	1.35	.....	1.07	.....
3	3	.....	3 Quinsy	.07	.....	.....	1.57	.....	.....	.....	.....
37	56	13	Totals	26.42	31.33	28.67	25.13	17.57	22.49	19.79	.....
5	11	6	V. CIRCULATORY SYSTEM.	.....	.....	.....	.....	.....	.....	.....	.....
1	1	4	6 Aneurism	.14	.40	.08	.....	.....	.....	.....	.....
38	83	14	166 Heart, Diseases of	3.92	5.62	2.91	4.71	8.10	4.42	2.67	.....
5	11	6	Totals	4.07	6.02	2.98	4.71	8.10	4.42	2.67	.....
1	3	.....	VI. DIGESTIVE SYSTEM.	.....	.....	.....	.....	.....	.....	.....	.....
1	2	2	4 Bowels, Diseases of	.09	.....	.23	.52	.....	.....	.....	.....
1	1	3	12 Colic	.28	1.21	.30	.....	.....	.80	.54	.....
3	4	10	1 Glossitis	.02	.....	.....	.....	.....	.40	.....	.....
1	1	18	40 Enteritis	.95	.40	.77	2.09	.....	1.61	1.60	.....
1	1	1	2 Gallstones	.05	.05	.....	.....	.....	.....	.54	.....
2	2	5	7 Hernia	.17	.25	.15	.....	.....	.....	.....	.....
1	1	2	3 Intussusception	.07	.10	.08	.....	.....	.....	.....	.....
2	2	.....	2 Jaundice	.05	.....	.....	1.05	.....	.....	.....	.....
7	1	17	45 Liver, Diseases of	1.06	.80	1.07	.52	4.05	.40	3.74	.....
1	3	16	22 Peritonitis	.52	.80	.23	.52	.....	.....	.....	.....
1	1	1	1 Spleen, Diseases of	.02	.....	.....	.....	.....	.....	.....	.....
2	6	14	24 Stomach, Diseases of	.57	.40	.46	1.05	.....	.40	.....	.....
2	2	4	6 Tabes Mesenterica	.14	.....	.15	.....	.....	.....	.....	.....

TABLE VIII.—CLASSIFICATION AND PERCENTAGE, 1878.—Continued.

NUMBER OF DEATHS IN EACH DIVISION OF THE STATE.						PERCENTAGE OF DEATHS IN EACH DIVISION.									
Bristol County.	Kent County.	Newport County, Towns.	Newport City.	Providence County, Towns.	Providence City.	Washington County.	CAUSES OF DEATH.	Percentage in the Whole State.	Washington County.	Providence City.	Providence County, Towns.	Newport City.	Newport County, Towns.	Kent County.	Bristol County.
1	1	1	1	6	6	1	Teething	.38	.40	.30	.46	.52	1.35	.40	.54
1	1	1	1	1	1	2	Worms	.05	.05	.52				.40	
13	10	4	13	51	86	10	Totals	4.42	4.02	4.36	3.90	6.81	5.41	4.02	6.95
VII. URINARY SYSTEM.															
				1	2	3	Bladder, Diseases of	.07		.10	.08				
				1	2	4	Diabetes	.09	.40	.10	.08				
4	3	1	2	21	47	80	Kidneys, Diseases of	1.89	.80	2.38	1.61	1.05	1.35	1.21	2.14
				4		4	Prostate, Diseases of	.09			.30				
			1			1	Uremia	.02				.52			
4	3	1	3	27	51	92	Totals	2.17	1.21	2.58	2.06	1.57	1.35	1.21	2.14
VIII. GENERATIVE SYSTEM.															
	1		1	3	8	2	Child-birth	.35	.80	.41	.23	.52		.40	
2	1	1	1	3	4	11	" Puerperal Convulsions.	.26		.20	.23		1.35	.40	1.07

1	2	2	1	1	6	13	2	1	1	Uterus, Disease of	.02	.80	.05	.46	.52	1.35	.80	1.07
										Totals	.64		.66					
IX. LOCOMOTIVE SYSTEM.																		
3	2	1	1	6	3	5	1	3	3	Hip-Joint, Diseases of	.07		.15					
16	1	1	1	2	4	4	1	5	16	Rheumatism	.38	.40	.25	.46	.52	1.35	.80	
7	1	1	1	2	4	4	1	5	7	Spine, Diseases of	.17		.20	.15				.54
										Totals	.62	.40	.61	.61	.52	1.35	.80	.54
X. INTEGUMENTIVE SYSTEM.																		
5	2	2	2	2	3	3	2	3	5	Skin, Diseases of	.12		.15		1.05			
2	1	1	1	1	2	2	1	2	2	Ulcer	.05	.80						
										Totals	.17	.80	.15		1.05			
15	8	8	9	23	76	61	30	222		XI. OLD AGE.	5.25	12.04	3.09	5.81	12.04	12.16	3.21	8.02
XII. EXTERNAL CAUSES.																		
1	2	1	1	20	16	16	1	41	41	Accidents (various)	.97	.40	.81	1.53	.52		.80	.54
3	1	2	4	19	7	7	1	11	11	Burns and Scalds	.26	.40	.36	.08		2.70		
3	1	1	1	1	16	16	1	44	44	Drowning	1.04	.40	.81	1.45	2.09		.40	1.60
3	1	1	1	1	7	7	2	13	13	Falls	.31	.80	.36	.08			1.31	
1	1	1	1	2	3	3	1	6	6	Poisoning	.14		.15	.15		1.35		
1	1	1	1	3	3	3	1	7	7	Railroad	.17		.15	.23	.52			
1	1	1	1	3	1	1	1	1	1	Exposure to cold	.02		.05					
1	1	1	1	3	1	1	1	4	4	Heat	.09		.05	.23				
12	1	1	1	2	7	7	1	12	12	Intemperance	.28		.36	.15	.52	1.35	.40	

TABLE VIII.—CLASSIFICATION AND PERCENTAGE, 1878.—Continued.

NUMBER OF DEATHS IN EACH DIVISION OF THE STATE.				PERCENTAGE OF DEATHS IN EACH DIVISION.													
			Whole State.	CAUSES OF DEATH.	Percentage in the Whole State.	Washington County.	Providence City.	Providence County, Towns.	Newport City.	Newport County, Towns.	Kent County.	Bristol County.					
Bristol County.	7	10	4	7	60	74	9	171	Totals	4.04	3.62	3.75	4.59	3.67	5.41	4.02	3.74

TABLE IX.—OCCUPATIONS AND AGES AT DEATH, 1878.

*Showing the Average Age, at Death, in the several occupations ; Providence City being separated from the rest of the State ; and ages under twenty being excluded.*

OCCUPATIONS.	WHOLE STATE.			PROVIDENCE CITY.			REST OF STATE.		
	Number who Died.	Aggregate Age.	Average Age.	Number who Died.	Aggregate Age.	Average Age.	Number who Died.	Aggregate Age.	Average Age.
<b>I. AGRICULTURE.</b>									
Farmers.....	152	9,932	65.34	6	444	74.00	146	9,488	64.98
Gardeners.....	3	192	64.00	1	55	55.00	2	137	68.50
<b>II. PROFESSIONAL AND PERSONAL SERVICES.</b>									
Artists.....	2	93	46.50	...	...	...	2	93	46.50
Author.....	1	48	48.00	...	...	...	1	48	48.00
Barbers.....	4	151	37.75	2	69	34.50	2	82	41.00
Canvasser.....	1	42	42.00	...	...	...	1	42	42.00
Civil Engineers.....	3	141	47.00	...	...	...	3	141	47.00
Clergymen.....	2	138	69.00	2	138	69.00	...	...	...
Clerks and Salesmen	25	792	31.68	18	577	32.06	7	215	30.71
Coachmen.....	2	85	42.50	2	85	42.50	...	...	...
Collector.....	1	47	47.00	1	47	47.00	...	...	...
Constables.....	2	159	79.50	2	159	79.50	...	...	...
Cook.....	1	25	25.00	1	25	25.00	...	...	...
Hostlers.....	2	93	46.50	...	...	...	2	93	46.50
Hotel-keepers.....	3	187	62.33	...	...	...	3	187	62.33
Janitors.....	2	89	44.50	2	89	44.50	...	...	...
Laborers.....	202	10,405	51.51	85	4,387	51.61	117	6,018	51.43
Laundryman (Chinese).....	1	20	20.00	...	...	...	1	20	20.00
Lawyers.....	4	216	54.00	3	167	55.67	1	49	49.00
Musicians.....	2	109	54.50	2	109	54.50	...	...	...
Music-teachers.....	2	123	61.50	1	73	73.00	1	50	50.00
Photographer.....	1	59	59.00	1	59	59.00	...	...	...
Physicians.....	7	405	57.86	2	120	60.00	5	285	57.00
Policemen.....	2	73	36.50	1	31	31.00	1	42	42.00
Reporters.....	2	88	44.00	2	88	44.00	...	...	...
Saloon-keepers.....	2	72	36.00	...	...	...	2	72	36.00
Stable-keepers.....	4	180	45.00	2	73	36.50	2	107	53.50
Student.....	1	20	20.00	1	20	20.00	...	...	...
Teachers.....	2	100	50.00	1	57	57.00	1	43	43.00
Undertaker.....	1	72	72.00	...	...	...	1	72	72.00
Waiters.....	2	93	46.50	2	93	46.50	...	...	...
Watchman.....	1	50	50.00	1	50	50.00	...	...	...

TABLE VIII.—CLASSIFICATION AND PERCENTAGE, 1878.—Continued.

NUMBER OF DEATHS IN EACH DIVISION OF THE STATE.							PERCENTAGE OF DEATHS IN EACH DIVISION.								
Bristol County.	Kent County.	Newport County, Towns.	Newport City.	Providence County, Towns.	Providence City.	Washington County.	CAUSES OF DEATH.	Percentage in the Whole State.	Washington County.	Providence City.	Providence County, Towns.	Newport City.	Newport County, Towns.	Kent County.	Bristol County.
							2 Lightning.....	.05			.15				
							3 Murder and Homicide.....	.07		.05	.15				
							3 Neglect.....	.07		.15					
3	2						21 Suicide.....	.50	1.61	.36	.38			.80	1.60
	1						3 Surgical Operation.....	.07		.10				.40	
7	10	4	7	60	74	9	Totals.....	4.04	3.62	3.75	4.59	3.67	5.41	4.02	3.74

TABLE IX.—OCCUPATIONS AND AGES AT DEATH, 1878.  
*Showing the Average Age, at Death, in the several occupations ; Providence City being separated from the rest of the State ; and ages under twenty being excluded.*

OCCUPATIONS.	WHOLE STATE.			PROVIDENCE CITY.			REST OF STATE.		
	Number who Died.	Aggregate Age.	Average Age.	Number who Died.	Aggregate Age.	Average Age.	Number who Died.	Aggregate Age.	Average Age.
<b>I. AGRICULTURE.</b>									
Farmers.....	152	9,932	65.34	6	444	74.00	146	9,488	64.98
Gardeners.....	3	192	64.00	1	55	55.00	2	137	68.50
<b>II. PROFESSIONAL AND PERSONAL SERVICES.</b>									
Artists.....	2	93	46.50	.....	.....	.....	2	93	46.50
Author.....	1	48	48.00	.....	.....	.....	1	48	48.00
Barbers.....	4	151	37.75	2	69	34.50	2	82	41.00
Canvasser.....	1	42	42.00	.....	.....	.....	1	42	42.00
Civil Engineers.....	3	141	47.00	.....	.....	.....	3	141	47.00
Clergymen.....	2	138	69.00	2	138	69.00	.....	.....	.....
Clerks and Salesmen	25	792	31.68	18	577	32.06	7	215	30.71
Coachmen.....	2	85	42.50	2	85	42.50	.....	.....	.....
Collector.....	1	47	47.00	1	47	47.00	.....	.....	.....
Constables.....	2	159	79.50	2	159	79.50	.....	.....	.....
Cook.....	1	25	25.00	1	25	25.00	.....	.....	.....
Hostlers.....	2	93	46.50	.....	.....	.....	2	93	46.50
Hotel-keepers.....	3	187	62.33	.....	.....	.....	3	187	62.33
Janitors.....	2	89	44.50	2	89	44.50	.....	.....	.....
Laborers.....	202	10,405	51.51	85	4,387	51.61	117	6,018	51.43
Laundryman (Chinese).....	1	20	20.00	.....	.....	.....	1	20	20.00
Lawyers.....	4	216	54.00	3	167	55.67	1	49	49.00
Musicians.....	2	109	54.50	2	109	54.50	.....	.....	.....
Music-teachers.....	2	123	61.50	1	73	73.00	1	50	50.00
Photographer.....	1	59	59.00	1	59	59.00	.....	.....	.....
Physicians.....	7	405	57.86	2	120	60.00	5	285	57.00
Policemen.....	2	73	36.50	1	31	31.00	1	42	42.00
Reporters.....	2	88	44.00	2	88	44.00	.....	.....	.....
Saloon-keepers.....	2	72	36.00	.....	.....	.....	2	72	36.00
Stable-keepers.....	4	180	45.00	2	73	36.50	2	107	53.50
Student.....	1	20	20.00	1	20	20.00	.....	.....	.....
Teachers.....	2	100	50.00	1	57	57.00	1	43	43.00
Undertaker.....	1	72	72.00	.....	.....	.....	1	72	72.00
Waiters.....	2	93	46.50	2	93	46.50	.....	.....	.....
Watchman.....	1	50	50.00	1	50	50.00	.....	.....	.....



TABLE IX.—OCCUPATIONS, 1878.—Continued.

OCCUPATIONS.	WHOLE STATE.			PROVIDENCE CITY.			REST OF STATE.		
	Number who Died.	Aggregate Age.	Average Age.	Number who Died.	Aggregate Age.	Average Age.	Number who Died.	Aggregate Age.	Average Age.
<b>III. TRADE AND TRANSPORTATION.</b>									
Agents.....	3	143	47.67	2	90	45.00	1	53	53.00
Apothecaries.....	4	209	52.25	2	85	42.50	2	124	62.00
Bankers.....	2	116	58.00	.....	.....	.....	2	116	58.00
Book-keepers.....	13	620	47.69	10	450	45.00	3	170	56.67
Boatmen.....	2	129	64.50	.....	.....	.....	2	129	64.50
Brokers.....	4	237	59.25	4	237	59.25	.....	.....	.....
Butchers.....	5	259	51.80	2	94	47.00	3	165	55.00
Cashiers (Bank, &c.)	3	159	53.00	2	88	44.00	1	71	71.00
Expressmen.....	2	108	54.00	2	108	54.00	.....	.....	.....
Fishermen and Oys- termen.....	3	180	60.00	.....	.....	.....	3	180	60.00
Grocers.....	8	370	46.25	6	231	38.50	2	139	69.50
Hackman.....	1	62	62.00	1	62	62.00	.....	.....	.....
Insurance Agent....	1	25	25.00	.....	.....	.....	1	25	25.00
Liquor Dealers.....	6	252	42.00	6	252	42.00	.....	.....	.....
Mariners.....	26	1,645	63.27	12	696	58.00	14	949	67.79
Marketman.....	1	68	68.00	1	68	68.00	.....	.....	.....
Merchants.....	29	1,864	64.28	15	1,021	68.07	14	843	60.21
Peddlers.....	6	226	37.66	3	119	39.67	3	107	35.67
Pilot.....	1	64	64.00	.....	.....	.....	1	64	64.00
Porter.....	1	38	38.00	1	38	38.00	.....	.....	.....
R. R. Station Agent.	1	32	32.00	.....	.....	.....	1	32	32.00
Ship Chandlers.....	2	134	67.00	2	134	67.00	.....	.....	.....
Teamsters.....	13	664	51.08	6	322	53.66	7	342	48.86
Telegrapher.....	1	22	22.00	1	22	22.00	.....	.....	.....
Traders and Dealers.	7	390	55.71	3	164	54.66	4	226	56.50
<b>IV. MANUFACTURES, MECHANICAL AND MINING INDUSTRIES.</b>									
Bakers.....	7	450	64.28	2	118	59.00	5	332	66.40
Belt-maker.....	1	64	64.00	1	64	64.00	.....	.....	.....
Blacksmiths.....	15	827	55.13	3	131	43.66	12	696	58.00
Bleachers.....	2	115	57.50	2	115	57.50	.....	.....	.....
Block-maker.....	1	74	74.00	1	74	74.00	.....	.....	.....
Boat-builder.....	1	70	70.00	.....	.....	.....	1	70	70.00
Book-binder.....	1	22	22.00	.....	.....	.....	1	22	22.00
Boot and Shoe-makers	13	728	56.00	8	399	49.88	5	329	65.80
Brush-maker.....	1	50	50.00	.....	.....	.....	1	50	50.00
Cabinet-maker.....	1	77	77.00	1	77	77.00	.....	.....	.....

TABLE IX.—OCCUPATIONS, 1878.—Continued.

OCCUPATIONS.	WHOLE STATE.			PROVIDENCE CITY.			REST OF STATE.		
	Number who Died.	Aggregate Age.	Average Age.	Number who Died.	Aggregate Age.	Average Age.	Number who Died.	Aggregate Age.	Average Age.
Calico-printers.....	3	176	58.67	3	176	58.67	...	...	...
Carpenters.....	44	2,442	55.50	24	1,254	52.25	20	1,188	59.40
Cigar-makers.....	3	147	49.00	1	47	47.00	2	100	50.00
Confectioner.....	1	32	32.00	1	32	32.00	...	...	...
Coopers.....	2	166	83.00	1	81	81.00	1	85	85.00
Designer.....	1	59	59.00	1	59	59.00	...	...	...
Die Sinkers.....	2	105	52.50	1	60	60.00	1	45	45.00
Dyer.....	1	47	47.00	1	47	47.00	...	...	...
Engineers.....	10	513	51.30	6	291	48.50	4	222	55.50
Farrier.....	1	67	67.00	...	...	...	1	67	67.00
File-makers.....	2	86	43.00	2	86	43.00	...	...	...
Gas Fitters.....	2	118	59.00	2	118	59.00	...	...	...
Harness-makers.....	4	184	46.00	2	113	56.50	2	71	35.50
Hatters.....	2	88	44.00	1	27	27.00	1	61	61.00
House Mover.....	1	73	73.00	...	...	...	1	73	73.00
Jewelers.....	24	996	41.50	18	781	43.39	6	215	35.83
Machinists.....	30	1,417	47.23	16	722	45.13	14	695	49.64
Manufacturers.....	12	766	63.83	7	443	63.29	5	323	64.60
Masons.....	22	1,381	62.77	9	518	57.56	13	863	66.38
Mechanics.....	16	824	51.50	6	315	52.50	10	509	50.90
Millwright.....	1	86	86.00	...	...	...	1	86	86.00
Miner.....	1	34	34.00	1	34	34.00	...	...	...
Moulders.....	5	240	48.00	4	172	43.00	1	68	68.00
Operatives.....	60	2,406	40.10	12	414	34.50	48	1,992	41.50
Overseers and Superintendents.....	6	297	49.50	1	26	26.00	5	271	54.20
Oyster Opener.....	1	38	38.00	1	38	38.00	...	...	...
Painters.....	18	946	52.44	5	300	60.00	13	646	49.69
Pattern-maker.....	1	26	26.00	...	...	...	1	26	26.00
Paper Hanger.....	1	52	52.00	...	...	...	1	52	52.00
Platers.....	2	88	44.00	2	88	44.00	...	...	...
Plumber.....	1	23	23.00	1	23	23.00	...	...	...
Pork Packer.....	1	55	55.00	1	55	55.00	...	...	...
Printers.....	2	83	41.50	2	83	41.50	...	...	...
Rubber-workers.....	2	68	34.00	...	...	...	2	68	34.00
Sail-maker.....	1	72	72.00	1	72	72.00	...	...	...
Ship Carpenters.....	4	257	64.25	2	137	68.50	2	120	60.00
Silversmiths.....	2	80	40.00	2	80	40.00	...	...	...
Stair Builder.....	1	24	24.00	1	24	24.00	...	...	...
Stone Cutters.....	7	352	50.26	1	51	51.00	6	301	50.17
Stucco-worker.....	1	29	29.00	1	29	29.00	...	...	...
Tailors.....	13	671	51.61	7	404	57.71	6	267	44.50
Tinsmiths.....	4	175	43.75	2	88	44.00	2	87	43.50

TABLE IX.—OCCUPATIONS, 1878.—Continued.

OCCUPATIONS.	WHOLE STATE.			PROVIDENCE CITY.			REST OF STATE.		
	Number who Died.	Aggregate Age.	Average Age.	Number who Died.	Aggregate Age.	Average Age.	Number who Died.	Aggregate Age.	Average Age.
Tool-maker.....	1	51	51.00	...	...	...	1	51	51.00
Umbrella-maker....	1	79	79.00	1	79	79.00	...	...	...
Upholsterers.....	2	63	31.50	...	...	...	2	63	31.50
Watch-maker.....	1	53	53.00	1	53	53.00	...	...	...
Wheelwrights.....	5	356	71.20	2	149	74.50	3	207	69.00
V. FEMALES.									
Actress.....	1	24	24.00	...	...	...	1	24	24.00
Book-binder.....	1	43	43.00	1	43	43.00	...	...	...
Dressmakers and Seamstresses....	9	274	30.44	8	247	30.88	1	27	27.00
Milliner.....	1	47	47.00	1	47	47.00	...	...	...
Nurse.....	1	40	40.00	...	...	...	1	40	40.00
Operatives.....	22	571	25.95	7	170	24.28	15	401	26.73
Servants.....	5	237	47.40	1	49	49.00	4	188	47.00
Sister of Mercy....	1	32	32.00	1	32	32.00	...	...	...
Tailoresses.....	2	84	42.00	1	28	28.00	1	56	56.00
Teachers.....	6	325	54.17	4	206	51.50	2	119	59.50

TABLE IX.—RECAPITULATION BY CLASSES.

OCCUPATIONS.	WHOLE STATE.			PROVIDENCE CITY.			REST OF STATE.		
	Number who Died.	Aggregate Age.	Average Age.	Number who Died.	Aggregate Age.	Average Age.	Number who Died.	Aggregate Age.	Average Age.
I. AGRICULTURE.	155	10,124	65.32	7	499	71.28	148	9,625	65.03
II. PROFESSIONAL AND PERSONAL SERVICES.....	287	14,175	49.39	134	6,516	48.63	153	7,659	50.06
III. TRADE AND TRANSPORTATION.....	145	8,016	55.28	81	4,281	52.85	64	3,735	58.36
IV. MANUFACTURES, MECHANICAL AND MINING INDUSTRIES.....	371	18,868	50.86	171	8,547	49.98	200	10,321	51.61
V. FEMALES....	49	1,677	34.22	24	822	34.25	25	855	34.20
ALL CLASSES. ...	1,007	52,860	52.49	417	20,665	49.56	590	32,195	54.57













OCCUPATIONS.	Whole Number of Given Causes.	Abcesses.																																												
		Accidents.	Aneurism.	Apoplexy and Paralysis.	Bladder, Disease of.	Brain, Disease of.	Bronchitis.	Cancer.	Cholera Morbus.	Colic.	Consumption.	Debility.	Diabetes.	Diarrhea.	Diphtheria.	Dropsy.	Dysentery.	Epilepsy.	Erysipelas.	Fever.	Gangrene.	Heart, Disease of.	Hemorrhage.	Hernia.	Insanity.	Intemperance and Delirium Tremens.	Kidneys, Disease of.	Liver, Disease of.	Lungs, Disease of.	Meningitis, Cerebro-Spinal.	Murder and Homicide.	Old Age.	Peritonitis.	Pneumonia.	Prostate, Disease of.	Rheumatism.	Stomach, Disease of.	Suicide.	Syphilis.	Tetanus.	Tuberculosis.	Tumor.				
Mechanics.....	15																																													
Milwright.....	1																																													
Miner.....	1																																													
Molders.....	5																																													
Operatives*.....	60																																													
Overscers and Superintendents.....	1																																													
Oyster Opener.....	6																																													
Painters.....	17																																													
Pattern-maker.....	1																																													
Paper Hanger.....	1																																													
Platers.....	1																																													
Plumber.....	2																																													
Pork Packer.....	1																																													
Printers.....	2																																													
Rubber-workers.....	1																																													
Sail-maker.....	2																																													
Ship Carpenters.....	2																																													
Silver Smiths.....	2																																													
Slat Builder.....	1																																													
Stone Cutters.....	1																																													
Stucco-worker.....	1																																													
Tailors*.....	13																																													
Tin-smiths.....	4																																													
Tool-maker.....	1																																													
Umbrella-maker.....	2																																													
Upholsterers.....	1																																													
Watch-maker.....	1																																													
Wheelwrights.....	1																																													
V. FEMALES.																																														
Actress.....	1																																													
Book-binder.....	1																																													

TABLE X.—OCCUPATIONS AND CAUSES OF DEATH, 1878.—Continued.

OCCUPATIONS.	Whole Number of given Causes.		Whole Number of given Causes.	
	9	2	1	6
Dressmakers and Seamstresses.	1	1	1	1
Milliner.	1	1	1	1
Nurse.	1	1	1	1
Operatives.	1	1	1	1
Servants.	1	1	1	1
Sister of Mercy.	1	1	1	1
Tailoresses.	1	1	1	1
Teachers.	1	1	1	1
Accidents.	1	1	1	1
Aneurism.	1	1	1	1
Apoplexy and Paralysis.	1	1	1	1
Brain, Diseases of.	1	1	1	1
Bronchitis.	1	1	1	1
Cancer.	1	1	1	1
Cholera Morbus.	1	1	1	1
Colic.	1	1	1	1
Consumption.	1	1	1	1
Debility.	1	1	1	1
Diabetes.	1	1	1	1
Diarrhea.	1	1	1	1
Diphtheria.	1	1	1	1
Dropsy.	1	1	1	1
Dysentery.	1	1	1	1
Enteritis.	1	1	1	1
Epilepsy.	1	1	1	1
Krysipelas.	1	1	1	1
Fever.	1	1	1	1
Gangrene.	1	1	1	1
Heart, Diseases of.	1	1	1	1
Hemorrhage.	1	1	1	1
Hernia.	1	1	1	1
Insanity.	1	1	1	1
Intemperance and Delirium Tremens.	1	1	1	1
Kidneys, Diseases of.	1	1	1	1
Liver, Diseases of.	1	1	1	1
Lungs, Diseases of.	1	1	1	1
Meningitis, Cerebro-Spinal.	1	1	1	1
Murder and Homicide.	1	1	1	1
Old Age.	1	1	1	1
Peritonitis.	1	1	1	1
Pneumonia.	1	1	1	1
Prostate, Disease of.	1	1	1	1
Rheumatism.	1	1	1	1
Stomach, Diseases of.	1	1	1	1
Suicide.	1	1	1	1
Syphilis.	1	1	1	1
Tetanus.	1	1	1	1
Tuberculosis.	1	1	1	1
Tumor.	1	1	1	1



TABLE XI.  
BIRTHS, MARRIAGES AND DEATHS IN RHODE ISLAND,  
IN 1878, COMPARED WITH THE POPULATION  
BY THE CENSUS OF 1875.

TOWNS AND DIVISIONS OF THE STATE.	Population in 1875.	Births in 1878. To population one birth in	Marriages in 1878. To population one person married in	Deaths in 1878. Of population one death in	Deaths in each 100 of the population.
Barrington.....	1,185	90 52.26	5 118.50	23 51.52	1.94
Bristol.....	5,829	159 36.66	51 57.15	85 08.58	1.45
Warren.....	4,006	79 50.69	48 41.72	86 47.12	2.12
<b>BRISTOL COUNTY.....</b>	<b>11,019</b>	<b>258 49.75</b>	<b>104 52.97</b>	<b>193 57.09</b>	<b>1.75</b>
Coventry.....	4,580	91 50.33	36 63.61	80 57.25	1.75
East Greenwich.....	3,120	53 60.00	30 52.00	40 78.00	1.28
West Greenwich.....	1,034	23 44.96	7 73.86	16 64.62	1.55
Warwick.....	11,614	284 40.89	73 79.55	152 70.41	1.31
<b>KENT COUNTY.....</b>	<b>20,348</b>	<b>450 45.22</b>	<b>146 69.69</b>	<b>288 70.65</b>	<b>1.41</b>
Jamestown.....	488	9 54.22	2 122.00	4 122.00	.82
Little Compton.....	1,156	9 128.44	10 57.80	12 96.33	1.04
Middletown.....	1,074	32 33.56	6 80.50	13 82.61	1.22
New Shoreham.....	1,147	12 95.58	1 573.50	9 127.44	.78
Portsmouth.....	1,893	28 67.61	5 189.30	20 94.45	1.06
Tiverton.....	2,101	67 31.36	17 61.78	18 116.76	.85
<b>TOWNS, NEWPORT COUNTY.....</b>	<b>7,859</b>	<b>157 50.06</b>	<b>41 95.84</b>	<b>76 106.41</b>	<b>.96</b>
<b>NEWPORT CITY.....</b>	<b>14,028</b>	<b>476 29.68</b>	<b>127 55.23</b>	<b>223 63.91</b>	<b>1.51</b>
Burrillville.....	5,249	190 40.37	34 77.19	66 79.56	1.26
Cranston.....	5,688	148 38.43	18 157.00	88 64.64	1.55
Cumberland.....	5,673	165 34.39	54 52.53	87 65.21	1.53
East Providence.....	4,336	166 26.12	19 114.10	90 48.18	2.06
Foster.....	1,543	22 70.14	42 18.37	16 96.44	1.04
Glocester.....	2,098	48 43.71	30 34.97	38 55.21	1.92
Johnston.....	4,999	135 37.03	27 92.57	46 104.68	.92
Lincoln.....	11,565	335 34.22	54 107.04	208 55.00	1.80
North Providence.....	1,303	26 50.12	2 325.70	14 93.07	1.07
North Smithfield.....	2,797	62 45.11	28 49.95	38 73.61	1.33
Pawtucket.....	18,464	528 34.97	168 54.95	332 55.61	1.79
Scituate.....	4,101	80 51.26	40 51.26	71 57.76	1.73
Smithfield.....	2,857	74 38.61	30 71.42	30 95.23	1.05
Woonsocket.....	13,576	404 33.60	147 46.18	287 47.30	2.11
<b>TOWNS, PROVIDENCE COUNTY.....</b>	<b>84,249</b>	<b>2,323 36.22</b>	<b>683 61.67</b>	<b>1,411 59.71</b>	<b>1.68</b>
<b>PROVIDENCE CITY.....</b>	<b>100,675</b>	<b>2,585 38.95</b>	<b>1,016 49.50</b>	<b>1,969 80.62</b>	<b>1.98</b>
Charlestown.....	1,054	14 75.29	7 75.29	15 70.27	1.42
Exeter.....	1,355	23 58.91	16 42.35	17 79.71	1.35
Hopkinton.....	2,700	65 42.62	41 59.61	47 58.72	1.70
North Kingstown.....	3,505	64 37.29	29 60.41	57 61.49	1.63
South Kingstown.....	4,240	106 40.00	59 54.96	47 90.21	1.11
Richmond.....	1,739	49 35.49	15 57.86	30 57.96	1.73
Westerly.....	5,408	114 47.44	60 45.07	48 112.54	.88
<b>WASHINGTON COUNTY.....</b>	<b>20,061</b>	<b>465 43.14</b>	<b>207 48.45</b>	<b>261 76.86</b>	<b>1.90</b>
<b>WHOLE STATE.....</b>	<b>258,239</b>	<b>6,714 38.46</b>	<b>*2,324 55.67</b>	<b>4,441 58.10</b>	<b>1.72</b>

\* Correction of Table I. by a corrected town return, received after the Table was in print.

## COMMENTS.

An examination of Table XI will show that the largest proportional number of births is returned from the town of East Providence, which reports one birth to every 26.12 persons in the town; the city of Newport follows, with one birth to every 29.68; and Tiverton with one to every 31.36.

On the other hand, the smallest proportional number of births to inhabitants is returned from the town of Little Compton, where but one birth is recorded to every 128.44 persons.

It will be observed that Bristol, Kent and Washington counties vary but slightly in their proportional birth rates, while Providence and Newport counties show a considerable difference in comparison with the three counties first named. For the whole State, the birth rate is one to every 38.46.

The difference in the ratio of marriages to population is more remarkable than that of births. New Shoreham reports one person married in every 573.50 of the population; North Providence, one person married to every 325.70. While, at the other extreme, Foster reports the extraordinary ratio of one person married to every 18.37 of the permanent residents, or one to less than every five families. The ratio for the whole State is one to every 55.67 of the population.

The largest percentage of deaths during the year 1878, was in the town of Warren, which was one decedent to every 47.12 persons, or 2.12 in each 100 of the population. Next following, one in 47.30 in Woonsocket; next, one in 48.18 in East Providence, and one in 50.63 in Providence city, or 1.98 per cent. of the population. Three towns only report a death rate of more than two per cent., viz.: Warren, 2.12; Woonsocket, 2.11; East Providence, 2.08.

The minimum of mortality in any one of all the towns in the State, for the year 1878, is reported from New Shoreham, and is one death in every 127.44 persons, or but little more than three-quarters of one per cent. of the population.

The towns reporting a death rate of less than one per cent. for the year, are New Shoreham, 0.78; Jamestown, 0.82; Tiverton, 0.85; Westerly, 0.88, and Johnston, 0.92.

The death rate for the whole State, is one decedent to every 58.06 of the population, or 1.72 in each 100.

The whole number of births recorded in 1878, is 6,714; marriages, 2,324, and deaths, 4,441.

In order to ascertain more definitely and correctly the average relation of these events to the population of the several towns in the State, for a series of years, the following Table is subjoined.

TABLE XII.

*Showing the Number of Births, Marriages and Deaths, in each town in the State, during each of the four years, 1875, 1876, 1877 and 1878, inclusive, with the aggregates of the same; also the proportions of the average number of the same to the population in each town, during the same period.*

TOWNS AND DIVISIONS OF THE STATE.	BIRTHS.					MARRIAGES.					DEATHS.					PERCENTAGE.					
	1875.		1876.		1877.	1878.	1875.		1876.		1877.	1878.	1875.		1877.		1878.	Whole num-ber Deaths, four years.	Average to population one in every		
	Population in 1875.	Whole num-ber Births, four years.	Average to population one in every	Whole num-ber Mar-riages, four years.			Average to population one in every	1875.	Average to population one in every	1876.			Average to population one in every								
Barrington.....	1,185	16	24	12	20	72	4	65.84	11	5	5	23	20	17	30	80	59.24	1.69			
Bristol.....	5,839	197	182	145	159	683	54	34.13	42	39	51	126	79	71	101	85	82.86	1.60			
Waltham.....	4,005	74	70	65	79	283	42	58.00	84	40	48	104	66	74	80	85	52.52	1.30			
BRISTOL COUNTY.....	11,019	287	276	222	256	1,043	100	42.24	87	84	104	275	165	162	201	198	721	61.13	1.63		
Covey.....	4,590	77	86	43	91	297	36	61.72	29	31	36	132	79	62	61	52	80	275	66.61	1.50	
East Greenwich.....	3,120	69	53	57	52	231	29	54.00	29	28	22	30	109	57	52	40	199	62.71	1.50		
West Greenwich.....	1,084	31	22	17	23	93	7	44.89	9	3	7	26	70	54	22	13	62	66.72	1.50		
Warwick.....	11,614	211	250	217	284	962	88	46.28	126	91	73	378	139	119	151	152	561	82.08	1.30		
KENT COUNTY.....	20,348	388	411	334	450	1,583	160	51.40	192	147	146	645	304	239	266	288	1,007	74.62	1.30		
Jamestown.....	498	3	3	5	9	20	1	97.60	1	3	2	7	137	40	5	8	4	90	97.60	1.02	
Little Compton.....	1,156	24	19	24	9	76	16	60.54	3	7	10	36	64	22	18	12	56	82.56	1.30		
Middletown.....	1,074	14	22	14	22	62	5	52.20	5	4	6	20	103	40	8	10	45	96.46	1.01		
New Shoreham.....	1,147	34	10	20	12	66	10	69.49	10	10	9	1	30	76	16	7	10	9	42	106.23	.93
Portsmouth.....	1,893	24	19	28	28	99	12	76.48	12	12	20	5	49	77	18	20	69	106.72	1.90		
Tiverton.....	2,101	60	46	42	67	215	33	39.06	11	32	17	93	45	38	34	30	18	71.30	1.40		
TOWNS, NEWPORT Co	7,859	149	119	133	157	557	77	56.06	42	75	41	235	99	93	98	76	350	96.81	1.10		
NEWPORT CITY.....	14,088	363	296	281	476	1,516	129	37.01	102	107	127	465	197	203	189	223	812	69.12	1.45		
NEWPORT COUNTY.....	21,887	511	415	514	633	2,073	206	42.24	144	182	162	700	296	296	271	299	1,162	74.80	1.34		

TOWNS AND DIVISIONS OF THE STATE	BIRTHS.				MARRIAGES.				DEATHS.				PERCENTAGE.						
	1875.		1877.		1878.		1879.		1876.		1877.			1878.					
	Population in 1875.	1875.	1876.	1877.	1878.	Average to one in every	1875.	1876.	1877.	1878.	Whole num-ber Births, Four years.	Whole num-ber Deaths, Four years.		Average to one in every					
Burrillville.....	5,249	125	108	118	130	481	51.96	30	25	43	34	132	74.53	69	68	74	66	277	75.80
Cranston.....	5,688	128	130	114	148	530	43.75	25	9	12	18	64	177.74	142	107	136	88	473	48.10
Cumberland.....	5,673	117	127	151	165	560	40.52	64	47	57	54	222	51.10	64	49	76	87	276	82.17
East Providence.....	4,386	86	139	125	166	516	33.61	36	31	24	19	110	78.84	61	65	55	90	271	64.00
Foster.....	1,543	24	23	18	22	93	66.36	19	20	27	42	108	28.58	12	17	19	16	64	96.44
Glocester.....	2,098	45	35	38	48	166	50.56	17	29	9	30	85	40.34	32	40	27	38	137	61.25
Johnston.....	4,999	116	114	117	135	482	41.49	18	21	36	27	102	98.00	75	53	76	46	250	79.95
Lincoln.....	11,565	362	342	353	335	1,392	33.23	54	50	47	54	205	112.82	174	155	223	208	780	40.30
North Providence.....	1,303	31	24	30	26	111	47.16	12	13	2	2	20	89.86	18	14	16	14	62	84.05
North Smithfield.....	2,797	68	61	73	62	264	42.37	32	34	24	28	118	47.20	34	31	48	38	151	73.82
Pawtucket.....	18,464	600	549	528	528	2,305	33.49	206	189	191	168	754	48.97	251	275	340	332	1,198	61.64
Scituate.....	4,101	72	79	74	80	305	52.48	55	47	63	40	205	40.00	79	52	53	71	255	64.32
Smithfield.....	2,857	67	58	68	74	267	42.80	29	23	25	20	97	58.90	27	21	37	30	115	96.37
Woonsocket.....	13,576	406	414	440	404	1,664	32.63	117	166	147	147	577	47.06	289	277	328	287	1,181	46.96
TOWNS, PROV. CO....	84,249	2,247	2,209	2,247	2,323	9,066	37.16	714	704	707	683	2,808	60.00	1,327	1,234	1,518	1,411	5,490	62.08
PROVIDENCE CITY....	100,675	2,664	2,631	2,543	2,585	10,403	38.70	1,079	949	953	1,016	3,967	50.36	1,915	1,895	1,938	1,989	7,707	52.25
PROVIDENCE CO....	184,924	4,911	4,840	4,780	4,908	19,469	38.03	1,793	1,633	1,690	1,699	6,805	54.35	3,242	3,099	3,456	3,400	13,197	56.05
Charlestown.....	1,054	22	12	9	14	57	73.82	4	7	10	7	28	75.28	19	17	15	15	66	63.87
Exeter.....	1,355	12	12	16	23	63	86.04	14	8	16	16	54	50.18	14	16	14	17	61	88.85
Hopkinton.....	2,760	51	75	49	65	240	46.00	48	25	36	41	150	36.80	33	51	29	47	100	69.00
North Kingstown.....	3,505	83	75	89	94	341	51.13	31	16	34	29	110	63.72	43	60	51	57	211	66.44
South Kingstown.....	4,240	86	103	83	106	378	44.88	35	35	37	39	146	58.08	85	75	72	47	279	60.78
Richmond.....	1,739	40	28	25	49	142	49.10	14	14	7	15	50	69.56	34	16	30	114	61.01	
Westerly.....	5,408	116	82	104	114	316	68.34	80	72	69	60	281	38.48	82	67	59	48	256	84.49
WASHINGTON CO....	20,061	410	387	375	405	1,637	48.98	226	177	209	207	819	48.98	310	320	256	261	1,147	69.96
WHOLE STATE.....	258,229	6,508	6,329	6,235	6,714	25,786	40.06	2,485	2,253	2,282	2,324	9,344	55.32	4,317	4,116	4,450	4,441	17,324	59.87



## COMMENTS.

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In Table XII will be found the number of births, marriages and deaths, in each of the towns, in each of the last four years of registration, together with the aggregate of the same in each of the towns, and in each of the counties during that period, and also a comparison of the average of these several events to the population, on the basis of the Census of 1875.

On consulting the Table, it will be seen that the proportions of the average number, for the whole period of four years, of the three classes of events, in the several towns, vary very greatly, as previously stated, in comparison with the population, but when aggregated into counties, the difference is considerably lessened, though even then they are far from uniform. While the average number of births in Woonsocket, for the period named, is one to every 32.63 of the population, the average of Jamestown is one to every 97.60.

The towns of Providence county show an average birth, for the period of four years, of one to every 37.16; the towns of Newport county, an average of one birth to every 56.08; Providence city, one in every 38.70, and Newport city, one in every 37.01.

The difference between the towns of Newport county and Newport city is quite remarkable. The average for the whole county of Newport is one in every 42.24, and for Providence county, one in 38.03.

The proportions of the average, for the same period, of the other counties are: Bristol, one in every 42.24; Kent, one in 51.40; Washington, one in 48.98. Average for the whole State, one birth in every 40.06 of the population.

The highest average marriage rate for the four years, is found in the town of Foster; that is, one person married to every 28.58 of the population. The town having the lowest average rate is Cranston, one person married to every 177.74 of the inhabitants.

The counties also vary considerably in the marriage rate. Washington county leading, with the marriage of one person to every 48.98 of the population, which is also the birth rate, or two children born to every marriage recorded. Providence county follows, with a rate of one to every 54.35; Newport county, one to 63.10; Kent county, one to 65.08, and Bristol county the smallest average, viz.: one to every 80.14 of the population. For the whole State, the mean average of the four years is one person married in every 53.32.

The highest average death rate is found in the town of Woonsocket; that is, one decedent in every 45.96 of the population, or 2.18 in each 100; next, Cranston, one in every 48.10, or 2.09 per cent.; Lincoln, one in 49.30, or 2.03 per cent. These are the only towns having a death rate reaching as high as two per cent.

Providence city shows an average rate, for the four years, of one decedent in every 52.25, or 1.91 per cent., and the town of Warren, one in every 52.50, or 1.90 per cent.

The lowest average death rate is found in Portsmouth; that is, one decedent in every 109.72 of the population, or 0.90 per cent.; next, New Shoreham, one in 109.23, or 0.91 per cent.; Smithfield, one in 99.37, or about 1.00 per cent. These are all the towns having a death rate as low as one per cent. or less.

The average death rate for the counties varies from one in every 56.05, or 1.78 per cent., in Providence county, to one in every 74.80, or 1.34 per cent., in Newport county. Newport county, towns, show only one decedent in every 89.81, or 1.10 per cent., while Newport city shows one in every 69.12, or 1.43 per cent. Providence county, towns, show one death in every 62.08, or 1.61 in each one hundred, while Providence city shows one in every 52.25, or 1.91 per cent.

The other counties show the average rate of one decedent in every 61.13, or 1.63 per cent., in Bristol county; one in every 69.96, or 1.43 per cent., in Washington county, and one in every 74.62, or 1.30 per cent., in Kent county.

For the whole State, the average of the four years is one decedent in every 59.87, or 1.67 in each 100 of the population.

For a more rapid comparison of the average percentage to the population of the births, marriages and deaths, in the different counties, for the period of four years, from 1875 to 1878, inclusive, the following synopsis is added:

	Marriages		
	Births	one person married	Deaths
	one in every	in every	one in every
Bristol County.....	42.24	80.14	61.13
Kent County .....	51.40	65.08	74.62
Newport County.....	42.24	63.10	74.80
Providence County.....	38.08	54.85	56.05
Washington County ..	48.98	48.98	69.96
Whole State.....	40.06	55.82	59.87

It may be of interest to contrast the births, on the basis of each 100 of the same, for the last four years, with the number of persons married, and with the deaths for the same period, in each of the larger divisions of the State.

In Bristol county the aggregate of births for the period named, were 1,043; number of persons married, 550; number of deaths, 721. The proportions, therefore, stand as follows: For every 100 births there were 69.13 deaths, and 26.36 marriages, or 52.72 persons married.

In Kent county, the aggregates were: births, 1,583; marriages, 645; deaths, 1,097. The proportions are as follows: For every 100 births there were 40.74 marriages, or 81.48 persons married, and 69.36 persons died.

In Newport county there were 2,073 births, 700 marriages and 1,162 deaths. The ratio for every 100 births, 33.50 marriages, or 67.00 persons married, and 56.05 persons died.

In Providence county there were 19,469 births, 6,805 marriages and 13,197 deaths. For every 100 births there were 35.00 marriages, or 70.00 persons married, and 67.78 deaths.

In Washington county there were 1,637 births, 819 marriages, and 1,147 deaths. For every 100 births there were 50 marriages, or 100 persons married, and 70 persons died.

In the whole State for the same period, there were 25,786 births; 9,344 marriages, or 18,688 persons married, and 17,324 persons died. The proportions for the whole State are, therefore, for every 100 births there were 36.21 marriages, or 72.42 persons married, and 67.02 persons died.

The following recapitulatory summary, will present the foregoing remarks more concisely and clearly:

	Persons Married.	Deaths
Bristol County.....To every 100 births there were.....	52.72.....	and 69.13
Kent County.....To every 100 births there were.....	81.48.....	and 69.36
Newport County.....To every 100 births there were.....	67.00.....	and 56.05
Providence County.....To every 100 births there were.....	70.00.....	and 67.78
Washington County.....To every 100 births there were.....	100.00.....	and 70.00
Whole State.....To every 100 births there were.....	72.42.....	and 67.02

TABLE XIII.

*Showing the proportions of Births, Marriages and Deaths, to the population, in the aggregate for the whole State, in each of the last ten years.*

YEARS.	BIRTHS.		MARRIAGES.		DEATHS.		
	Number.	To population one birth in	Number.	Of population one person married in	Number.	Of population one death in	Deaths in each 100 of the population.
1869.....	5,245	41.4	2,289	47.5	3,382	64.2	1.56
1870.....	5,215	41.7	2,362	46.0	3,238	67.1	1.49
1871.....	5,678	38.2	2,336	46.5	3,344	65.0	1.54
1872.....	6,143	35.4	2,587	42.9	4,247	51.2	1.95
1873.....	6,022	36.1	2,630	41.3	4,403	49.4	2.03
1874.....	6,466	39.0	2,541	50.8	4,229	61.1	1.64
1875.....	6,508	39.7	2,485	52.0	4,317	59.8	1.67
1876.....	6,329	40.8	2,253	57.3	4,116	62.7	1.59
1877.....	6,235	41.4	2,282	56.6	4,450	58.0	1.72
1878.....	6,714	38.5	2,224	55.7	4,441	58.1	1.72

## B I R T H S , 1 8 7 8 .

In Tables I and II, on pages 18 to 21, inclusive, will be found the general statistics in relation to births in Rhode Island during the year 1878. The whole number reported, is 6,714, which is larger by 479 than during the year 1877, and larger by more than 200, of any previous year in the history of the State.

### SEX OF THE CHILDREN BORN.

Of the 6,714 children whose births were reported in 1878, there were 3,402 males, and 3,312 females. This gives 102.7 males to each 100 females; or 50.67 males and 49.33 females in each 100 children. The following recapitulatory Table shows the numbers and sex, and the proportions of each sex of the children born in Rhode Island, in each of the last twenty-five years.

TABLE XIV.

Years.	Males.	Females.	Males to each		Males.	Females.
			100 Females.			
1854.	1,081	1,008.	107.8, or.		51.87	and 48.13 in each 100.
1855	1,492	1,421.	105.0, or.		51.22	and 48.78 in each 100.
1856.	1,479	1,407.	105.1, or.		51.25	and 48.75 in each 100.
1857.	2,057	1,948.	105.6, or.		51.36	and 48.64 in each 100.
1858.	2,200	2,058.	107.2, or.		51.73	and 48.27 in each 100.
1859.	2,209	2,097.	105.3, or.		51.30	and 48.70 in each 100.
1860.	2,263	2,212.	102.3, or.		50.57	and 49.43 in each 100.
1861.	2,531	2,291.	110.5, or.		52.49	and 47.51 in each 100.
1862.	2,152	1,967.	109.4, or.		52.25	and 47.75 in each 100.
1863.	1,892	1,388.	105.8, or.		51.41	and 48.59 in each 100.
1864.	1,949	1,942.	100.3, or.		50.09	and 49.91 in each 100.
1865.	2,096	1,857.	112.9, or.		53.02	and 46.98 in each 100.
1866.	2,546	2,356.	108.0, or.		51.94	and 48.06 in each 100.
1867.	2,685	2,464.	107.0, or.		51.87	and 48.13 in each 100.
1868.	2,745	2,627.	104.5, or.		51.10	and 48.90 in each 100.
1869.	2,685	2,560.	104.9, or.		51.19	and 48.81 in each 100.
1870.	2,679	2,536.	105.6, or.		51.37	and 48.63 in each 100.
1871.	2,878	2,800.	102.8, or.		50.69	and 49.31 in each 100.
1872.	3,085	3,058.	100.9, or.		50.22	and 49.78 in each 100.
1873.	3,135	2,887.	108.6, or.		52.06	and 47.94 in each 100.
1874.	3,311	3,155.	104.9, or.		51.21	and 48.79 in each 100.
1875.	3,392	3,146.	106.9, or.		51.66	and 48.34 in each 100.
1876.	3,291	3,088.	106.3, or.		52.00	and 48.00 in each 100.
1877.	3,163	3,072.	103.0, or.		50.73	and 49.27 in each 100.
1878.	3,402	3,312.	102.7, or.		50.67	and 49.33 in each 100.
25 Years.	62,348	58,497	106.5, or.		51.60	and 48.40 in each 100.

## PROPORTION OF THE SEXES.

The proportion of males, 102.7 to 100 females, in the births of 1878, was 3.8 in each 100 less than the average for the 25 years, inclusive. In only three of the preceding 24 years was the proportion of male children born less than in 1878.

The proportion of the sexes, in any single year, varies greatly in different portions of the State. The number and proportion in each division, in 1878, were as follows:

TABLE XV.

BIRTHS, 1878.	Bristol County.	Kent County.	Newport County, Towns.	Providence County, Towns.	Washington County.	Newport City.	Total.	Providence City.	Whole State.
Males.....	141	246	85	1,167	205	223	2,067	1,335	3,402
Females.....	117	204	72	1,156	260	263	2,062	1,250	3,312
Total.....	258	450	157	2,323	465	476	4,129	2,585	6,714
Males to each 100 Females..	120.5	120.6	118.0	101.0	78.8	88.1	100.2	106.8	102.7

## PROPORTION OF THE SEXES: PROVIDENCE CITY AND THE STATE.

The question of the probability "that the different conditions of existence in town and country might influence the proportions of the sexes of the children born," will be considered by comparison of the statistics of births in the city of Providence, which supplies the most essential conditions of city life, with those of the rest of the State.

The number of children born in the city of Providence, during the year 1878, was 2,585, of whom 1,335 were males, and 1,250 were females. The proportion is, therefore, 106.8 males to each 100 females, or 51.64 males and 48.36 females in each 100 children.

In the rest of the State, during the same year, the number of births were 4,129, of which 2,067 were males, and 2,062 were females, or 100.2 males to 100 females; or 50.06 males, and 49.94 females, in each 100 children born.

The following shows the proportion of the sexes of the children born, in Providence, and in the rest of the State, during the years 1877 and 1878, and also in the twenty-five years from 1854 to 1878, inclusive:

## 1877.

		Males to each			
	Males.	Females.	100 Females.	Males.	Females.
Providence City.....	1,302	1,341	104.9, or.....	51.20	and 48.80 in each 100.
Rest of the State.....	1,861	1,831	101.6, or.....	50.41	and 49.59 in each 100.

## 1878.

		Males to each			
	Males.	Females.	100 Females.	Males.	Females.
Providence City.....	1,335	1,250	106.8, or.....	51.64	and 48.36 in each 100.
Rest of the State.....	2,067	2,062	100.2, or.....	50.06	and 49.94 in each 100.

## TWENTY-FIVE YEARS, 1854 TO 1878, INCLUSIVE.

		Males to each			
	Males.	Females.	100 Females.	Males.	Females.
Providence City... ..	24,051.	22,774	105.6, or....	51.36	and 48.64 in each 100.
Rest of the State.....	38,297	35,723	107.2, or.....	51.74	and 48.26 in each 100.

The foregoing comparisons show that although the proportional number of male births in the city of Providence, for the years 1877 and 1878, were considerably in excess of the same in the rest of the State, for the same years, it does not hold good for the long period of twenty-five years.

The following Table shows the relative proportions of the sexes, in each division of the State, in each of the last sixteen years. This Table does not show the contrast between Providence city and the rest of the State; the statistics are for the "Whole State," and include those of the city.

TABLE XVI.

NUMBER OF MALES TO EACH 100 FEMALES.							
BIRTHS.	Bristol County.	Kent County.	Newport County.	Providence County, Towns.	Providence City.	Washington County.	Whole State.
1863.....	120.0	98.4	97.0	101.8	111.4	108.7	106.8
1864.....	106.8	87.8	90.6	107.4	97.3	108.4	100.3
1865.....	119.3	118.2	108.8	118.9	113.8	88.1	112.9
1866.....	109.4	113.1	103.4	104.9	108.4	124.0	108.0
1867.....	115.5	98.3	117.8	106.3	104.5	120.4	107.7
1868.....	117.4	88.7	100.2	101.6	102.4	136.5	104.5
1869.....	115.7	116.7	102.7	98.0	107.5	120.6	104.9
1870.....	126.4	111.6	100.0	105.1	104.9	99.5	105.6
1871.....	181.8	97.9	122.5	100.8	95.2	113.8	102.8
1872.....	109.2	92.8	109.1	108.5	95.7	110.6	100.9
1873.....	129.2	113.0	117.9	104.5	109.0	104.7	108.6
1874.....	96.7	111.9	101.3	110.4	102.9	94.0	104.9
1875.....	95.2	103.1	97.7	104.3	109.1	134.3	106.9
1876.....	142.1	104.4	108.5	108.0	106.8	108.7	108.3
1877.....	138.7	102.4	98.5	100.3	104.9	96.3	103.0
1878.....	120.5	120.6	94.8	101.5	106.8	78.8	102.7

## BIRTHS: SEX AND SEASON.

In Table II, on page 20, will be found the number of births, as they occurred during the year 1878, arranged by the several months, and by the sexes. From it we ascertain the number of each of the sexes born during each quarter of the year, with their relative proportions, and also the aggregate and proportions of the same for the whole State.

The following Table will present a summary of the quarterly periods, number of births and proportion of the sexes, for the same:

	Males.	Females.	Males to each 100 Females.	Males.	Females.
1. January—March .....	837	785	106.6, or.....	51.50	and 48.50 in each 100.
2. April—June.....	778	787	98.9, or.....	49.65	and 50.35 in each 100.
3. July—September.....	880	851	103.8, or.....	50.83	and 49.17 in each 100.
4. October—December.....	907	889	102.0, or.....	50.50	and 49.50 in each 100.
Year, 1878.....	3,402	3,312	102.7, or.....	50.06	and 49.94 in each 100.



The following Table shows the number of male children born to each 100 female children, in each quarter of each of the last thirteen years:

TABLE XVII.

YEARS.	1878.	1877.	1876.	1875.	1874.	1873.	1872.	1871.	1870.	1869.	1868.	1867.	1866.
First Quarter.....	106.6	107.9	106.7	97.7	100.4	98.3	98.8	112.4	111.6	107.3	102.4	105.5	108.7
Second Quarter.....	98.9	103.1	109.2	113.8	108.2	105.9	100.5	95.0	100.8	105.1	118.8	108.9	102.9
Third Quarter.....	103.8	97.6	106.0	106.2	105.1	109.9	101.6	99.3	101.0	101.9	103.1	110.4	113.8
Fourth Quarter.....	102.0	104.2	110.4	107.9	105.9	110.4	103.4	105.0	109.2	105.6	96.2	106.5	106.6
Whole Year.. .. .	102.7	103.0	108.3	106.9	104.9	108.6	100.9	102.8	105.6	104.9	104.5	107.7	108.0

The proportion of male to female children born during the year 1878, in the whole State, was more nearly equal, than during any one of the last thirteen years, except the year 1872. As usual, there are considerable differences between the several quarters of the year, though not so great as in the larger number of years.

For the purpose of illustrating more fully the possible influence of season upon the development or causation of sex of the children born in Rhode Island, the following Table has been continued from the Registration Report of 1877, which shows the number and sex of the children born in the State, in each quarter of the year, in the aggregate for seventeen years, from 1860 to 1876, inclusive; and also the proportion of the sexes in each quarter:

Seventeen Years.	Males to each			
	Males.	Females.	100 Females.	Males. Females.
1. January—March.....	10,600.....	10,023, or.....	105.7, or.....	51.39 and 48.61 in each 100 born.
2. April—June.....	10,730.....	10,035, or.....	106.8, or.....	51.65 and 48.35 in each 100 born.
3. July—September .....	11,648.....	11,093, or.....	105.0, or.....	51.22 and 48.78 in each 100 born.
4. October—December.....	12,285.....	11,530, or.....	106.5, or.....	51.58 and 48.42 in each 100 born
Whole No. of Years....	45,253.....	42,686, or...	106.0, or.....	51.46 and 48.54 in each 100 born.

In the report for the year 1879, the number may be extended to a period of twenty years, which may, perhaps further elucidate the question, though it is not at all probable that it will materially alter the results shown in the above tabulation.

## BIRTHS AND SEASON.

As a question not merely of speculative curiosity, but of considerable importance, the influence of season upon human fruitfulness may properly receive some attention.

The following Table shows the total number of children, without regard to sex, born in the State of Rhode Island, (according to the returns,) in each quarter of each of the last nine years; and also the aggregate number and the percentage of the aggregate in each quarter for twenty-five years, from 1853 to 1877, inclusive :

TABLE XVIII.

QUARTERS.	1878.	1877.	1876.	1875.	1874.	1873.	1872.	1871.	1870.	1853 to 1877.	
										Number.	Per cent.
January—March.....	1,622	1,399	1,524	1,546	1,485	1,383	1,348	1,332	1,183	27,417	23.73
April—June.....	1,565	1,406	1,496	1,608	1,555	1,399	1,464	1,299	1,243	27,610	23.69
July—September.....	1,731	1,674	1,668	1,668	1,662	1,583	1,663	1,475	1,327	30,215	26.15
October—December....	1,796	1,756	1,641	1,686	1,744	1,658	1,668	1,572	1,462	30,323	26.34
Whole Year.....	6,714	6,235	6,329	6,508	6,466	6,022	6,143	5,678	5,215	115,564	100.00

It will be noticed upon inspection of the above Table, that the reported occurrence of births during the year 1878 has followed the general rule for the period of nine years, in the occurrence of the smaller number of these events during the first half of the year. It may be said also to be the rule for the whole period of registration. It will also be observed, that during the last nine years the numbers have almost uniformly increased regularly from the first quarter to the last. The reason is, without question, due more to defective registration than to any influence of the season.

It has been found that in those cities and sections where the returns of births are collected semi-annually, that no such disparity of numbers of births, occurring in the earlier and later months of the year, exists, although the number still holds somewhat larger for the later months.

The collector of returns, canvassing a town in the month of January of a year succeeding that in which the births occurred, will fail to find some families in which there have been births during the first months of the previous year, for the reason that they have removed

to other towns. Then, again, some parents even, from forgetfulness or heedlessness, and especially when a child dies during the first weeks or months of infancy, will fail to report to the collector when called upon. But for the later months of the year, in Rhode Island, the removal of families is very much less frequent, and the memory of heedless persons called upon in the January following has not so long a period of time to cover.

It is, however, quite possible that the circumstances of season, the modes of living, the temperature and other meteorological conditions of the colder months, may have some influence in the aptness to reproduction.

The percentages of the different quarters of the year 1878, were as follows: First quarter, 24.15; Second quarter, 23.30; Third quarter, 25.78; Fourth quarter, 26.75.

It will be seen that the percentages of the several quarters correspond very closely with the average percentages of the same quarters, for the period of twenty-five years, scarcely exceeding one-half of one per cent. in any instance.

#### PARENTAGE.

The following Table will show the parentage of the children born in the State, and the variations of the same from year to year, in each of the last six years, and also the number and variations occurring in three periods of five years each, from 1858 to 1872, inclusive:

TABLE XIX.

PARENTAGE.	1878.	1877.	1876.	1875.	1874.	1873.	5 years. 1868 to 1872.	5 years. 1863 to 1867.	5 years. 1858 to 1862.
American.....	2,887	2,665	2,585	2,727	2,708	2,751	12,214	9,712	10,609
Foreign.....	2,648	2,642	2,873	2,906	2,948	2,621	12,366	9,968	9,697
Amer. father and For. mother...	463	416	354	389	345	278	1,353	876	814
For. father and Amer. mother...	516	512	517	486	470	372	1,730	941	755
Parentage not stated.....								70	223
Total.....	6,714	6,235	6,329	6,508	6,466	6,022	27,653	21,567	22,008

In order to present the comparisons in a different and, perhaps, clearer light, the following Table of percentages is subjoined:

TABLE XX.

PARENTAGE.	1878.	1877.	1876.	1875.	1874.	1873.	5 years. 1868 to 1872.	5 years. 1863 to 1867.	5 years. 1858 to 1862.
American.....	43.00	42.74	40.84	41.90	41.80	45.68	44.17	45.18	48.50
Foreign.....	42.82	42.38	45.40	44.65	45.59	43.52	44.72	46.87	44.33
Amer. father and For. mother...	6.35	6.67	5.59	5.98	5.84	4.62	4.89	4.07	3.72
For. father and Amer. mother...	7.83	8.21	8.17	7.47	7.27	6.18	6.22	4.88	3.45
Total.....	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

A study of the preceding Tables will show, as might reasonably be expected, that the number of births occurring among the different classes of the population, varies very considerably in the different years.

The percentage of children of purely American parentage, in proportion to the whole number of births, had gradually declined for a series of years, until in 1876, it was only 40.84; in 1877, it had risen to 42.74; and in 1878, to 43.00 in each 100.

Of the children of purely foreign parentage, the percentage has been in excess of the purely American, for a considerable number of years, with the exceptions of 1873, 1877 and 1878.

Of the class of mixed parentage, the percentage of births has steadily increased up to the year 1878, in which there was a slight decrease. The social sentiment has evidently been increasing in the direction of the breaking down of class distinctions dependent on nativity, and the slight pause during the year 1878, will doubtless be temporary.

Table XIX shows that there were, in 1878, more foreign than American fathers, and more American than foreign mothers. Inasmuch as it is conceded that foreign mothers are more prolific on American soil than native American mothers, the natural inference would be that more American wives have foreign husbands, than *vice versa*, and such will be found to be true, when the subject of marriages is taken up.

Table XX shows a larger percentage of children born, in 1878, of purely American than purely foreign parentage. But this is true only in the proportion to the whole number of births during the year, and not in the proportion of the births to the whole population. There being a larger American than foreign population, we should

expect, all other things being equal, that there would be not only a larger number of births of American parentage, but that the percentage would be in an equal ratio with the population. Such, however, is not the fact.

By the Census of 1875, the population, according to parentage, was as follows:

American..... 134,722, or 52.17 per cent.

Foreign..... 123,517, or 47.83 per cent.

The above enumeration was in accordance with the nativity of the fathers, and for reasons stated above, slightly in favor of the foreign element. If, now, we compare the number of children born in the different classes, in 1878, with the proportion the same classes bear to the whole population, we shall find that of each 100 children born, 49.89 had American fathers, and 50.11 had foreign fathers.

In order to contrast the number and percentages of the children born in the different classes, as seen in the two preceding Tables, with the percentages according to the population, for the same number of years, the following Table is introduced:

TABLE XXI.

CHILDREN WITH	1878.	1877.	1876.	1875.	1874.	1873.	5 years. 1868 to 1872.	5 years. 1863 to 1867.	5 years. 1858 to 1862.
American fathers.....	49.89	49.41	46.43	47.88	47.14	50.30	49.06	49.25	52.22
Foreign fathers.....	50.11	50.59	53.57	52.12	52.86	49.70	50.94	50.75	47.78
American mothers.....	50.68	50.95	49.01	49.37	49.07	51.86	50.39	49.56	51.95
Foreign mothers.....	49.32	49.05	50.99	50.63	50.93	48.14	49.61	50.44	48.05

It will be seen that the percentage of children born of American parentage, has been almost uniformly less than the proportion of the American to the whole population, and the percentage of children born of foreign parentage, has been equally uniform in being larger than the proportion of that class to the whole population.

#### COLORED CHILDREN.

The number of births of children of colored parentage, reported for the year 1878, is 172. They are always included in the general statis-

tics of births, but having some special importance as to the survival of the race, and other questions, they have had a separate consideration. The number is larger by 4 than that of 1877. Larger by 1 than that of 1876, and larger by 16 than that of 1875.

In regard to sex, the numbers and proportions were as follows, viz.: Males, 79; females, 93; or 46.00 males and 54.00 females in each 100 births; or 85.00 males to each 100 females.

The towns reporting colored births in 1878, and the number in each, are as follows:

Bristol.....	8	East Providence.....	2	Hopkinton.....	4
East Greenwich.....	2	Johnston.....	2	North Kingstown.....	2
Warwick.....	4	Lincoln.....	1	South Kingstown.....	9
Newport City.....	27	Pawtucket.....	2	Westerly.....	2
Cranston.....	2	Charlestown.....	1	Providence City.....	104
Total.....					172.

#### NUMBER OF THE CHILD OF THE MOTHER.

The following Table will be found interesting, as showing the capacity of the females of Rhode Island for long periods and frequent repetition of productiveness. The general condition of the public health, and the physical vigor and power of endurance of any class of people, may be determined in a large measure by such statistics. In Rhode Island, however, they would be less reliable than in sections of this or of other countries, where the disposition to avoid a repetition of child-bearing, or of avoiding it entirely, was less universal. The Table shows the number of the child of the mother; that is, how many of the children born were reported as the first, second, third, &c., of their respective mothers. The statistics on this subject begin with the year 1857, and the following Table includes the children reported in 1878, as well as those in the twenty-one years from 1857 to 1877, inclusive, and also the total for twenty-two years, 1857 to 1878, inclusive:

TABLE XXII.

NUMBER OF THE CHILD OF THE MOTHER.	1878.	21 years. 1857 to 1877.	22 years. 1857 to 1878.
First.....	1,462	25,806	27,268
Second... ..	1,360	21,127	22,487
Third.....	1,069	16,356	17,425
Fourth.....	828	12,202	13,024
Fifth... ..	589	9,096	9,685
Sixth.....	489	6,510	6,999
Seventh... ..	319	4,568	4,887
Eighth.....	238	3,078	3,316
Ninth.....	136	2,064	2,200
Tenth .....	96	1,346	1,442
Eleventh... ..	54	752	806
Twelfth.....	38	460	498
Thirteenth.....	18	234	242
Fourteenth.....	8	114	122
Fifteenth.....	7	68	70
Sixteenth.....	2	31	33
Seventeenth.....	1	24	25
Eighteenth... ..	1	6	7
Nineteenth.....	0	5	5
Twentieth. . .	0	3	3
Twenty-first .....	1	2	3
Twenty-second.....	0	2	2
Total .....	6,714	108,839	110,658

The proportion of the first children of the mother, born in Rhode Island during the year 1878, according to the returns, was 21.77 in each 100; in 1877, it was 22.93 in each 100, and in the average for twenty-one years, 1857 to 1877, inclusive, it was 24.85 in each 100.

The proportion of second children in 1878, was 20.26 in each 100; in 1877, it was 20.98, and the average for twenty-one years, as above, it was 20.35 in each 100.

In nearly every year there are births, the record of which does not give the number of child of the mother; consequently, the above Table

does not include all the children born and recorded during the periods named.

The following Table shows what percentage of the children born in each of the last eleven years, were the first, second, &c., children of the mothers:

TABLE XXIII.

NUMBER OF THE CHILD.	1878.	1877.	1876.	1875.	1874.	1873.	1872.	1871.	1870.	1869.	1868.
First.....	21.77	22.98	24.11	24.37	25.54	25.27	25.39	25.86	26.41	25.23	27.24
Second.....	20.26	20.98	20.63	20.80	21.09	20.80	20.36	20.78	20.40	20.84	19.83
Third.....	18.90	16.22	16.04	14.93	15.53	15.88	15.64	16.06	15.56	15.02	13.92
Fourth.....	12.82	12.09	12.00	11.78	10.97	11.35	11.52	10.79	10.33	11.30	11.65
Fifth.....	8.77	9.07	8.42	8.81	8.56	8.25	7.96	7.86	8.12	8.89	8.01
First to Fifth.....	82.02	81.29	81.20	80.69	81.69	81.55	80.87	81.35	80.82	80.78	80.65
Sixth and over.....	17.98	18.71	18.80	19.31	18.31	18.45	19.13	18.65	19.18	19.22	19.25
Total.....	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

From the above Table, it will be perceived that the percentages of first and second children of the mother, born in 1878, were the smallest on record during the last eleven years, and the percentages of the third and fourth, were the largest of any one of the same number of years. It will also be noticed, that the aggregate percentages of the classes, from the first to the fifth, inclusive, of the year 1878, is larger than any other recorded during the same period of eleven years.

It will be understood that the decrease in the *percentages* of births of the first and second child of the mother, does not imply a lessened number of such births—which is not true of 1878—but a larger proportional number of third, fourth, &c., number of child. A continuance of the larger percentage of the higher number of child, for two or three years, consecutively, would indicate a healthier public sentiment, as well as improved physical stamina.

#### PLURALITY BIRTHS.

The statistics of the plurality births in Rhode Island, for 1878, show that there were fifty-six cases during the year; fifty-five of twins and one of triplets. The number of children was 113, of which 74 were males, and 39 were females.



For a period of twenty-six years, viz., from 1853 to 1878, inclusive, the general statistics of births in Rhode Island are as follows:

190,691 cases of single births.....	giving 190,691 children.
1,399 cases of twin births.....	giving 2,598 children.
18 cases of triple births.....	giving 54 children.
<hr/>	
122,008 cases of child-birth.....	giving 122,343 children.

Of the whole number of cases of child-birth (122,008) in the twenty-six years, one in 93.9 produced twins, and one in 6,781 produced triplets.

Of the whole number of children born during the same period, (123,343,) according to the statistics, one in every 47 was a twin, and one in every 2,283 was a triplet.

Of the 1,317 cases of plurality births in the twenty-six years, there were 560 in which both parents were American; 642 cases in which both parents were foreign; 107 cases in which the parentage was mixed, and 8 of which the parentage was unknown.

The whole number of children born in plurality cases during the twenty-six years, was 2,652, of whom 1,328 were males, and 1,320 were females; the sex of the remaining four was not given.

#### STILL-BORN CHILDREN.

The statistics in relation to still-born children are obtained from the returns of deaths, but are not numbered with, or in any way included in, the statistics of deaths in this report.

For the reason that they occupy a somewhat anomalous position in the statistics of life and death, they are given a separate consideration.

The whole number of still-born children reported in Rhode Island for the year 1878, was 248; this is 6 more than for the year 1877, and 25 more than for 1876.

#### SUMMARY OF STILL-BORN.

The following Table shows the number and sex of the still-born children, whose births were reported in Rhode Island, during the period from June 1, 1852, to December 31, 1872, and for each of the last six years:

TABLE XXIV.

SEX.	1878.	1877.	1876.	1875.	1874.	1873.	June 1, 1852, to Dec. 31, 1872.	Total.
Males.....	149	147	181	188	172	145	1,966	2,843
Females.....	99	95	92	113	105	83	1,308	1,890
Sex not stated.....							52	52
Total.....	248	242	223	246	277	228	3,321	4,785

It will be seen that the whole number of still-births reported in the State since June 1, 1852, is 4,785. Of the sex of this number, there were 2,843 males; 1,890 females, and of 52 the sex was not given. The ratio of occurrence, in regard to sex, would therefore be as follows: In each 100 children there were 60 males, and 40 females; or for every 100 females, there were 150 males.

It will be seen, also, that the proportion for the year 1878, is almost exactly the same as the average of a period of more than twenty-six years. Why there should be constantly, in every year, so large an excess of males among the still-born, is a question of difficult solution.

*Season of Still-births.*—The following summary will show the number of still-births that have been reported in Rhode Island, during a period of twenty-six years, from 1853 to 1878, inclusive, with the months and quarters in which they occurred:

## STILL-BORN—TWENTY-SIX YEARS—1853-1878. SEASON.

January..... 430	April..... 387	July..... 406	October..... 364
February..... 390	May..... 371	August..... 433	November..... 402
March..... 383	June..... 350	September..... 392	December..... 449
1st Quarter..... 1,212	2d Quarter..... 1,088	3d Quarter..... 1,231	4th Quarter..... 1,215

First six months, 2,300; second six months, 2,446; unknown, 39; total, 4,785.

## MARRIAGES, 1878.

The number of marriages reported in Rhode Island in 1878, was 2,324. This number is larger by 142 than in 1877. The number of marriages in each division of the State, in each month and quarter of the year 1878, may be found in Table III, page 22.

### SEASON.

The number and percentage of the marriages in Rhode Island, in each quarter of the year 1878, may be found in the following Table, together with the aggregate number and percentage in each quarter, for the twenty-five years previous, viz., from 1853 to 1877, inclusive:

TABLE XXV.

YEARS.		First Quarter.	Second Quarter.	Third Quarter.	Fourth Quarter.	Whole Year.
1878.....	{ Number.....	517	570	558	679	2,324
	{ Percentage.....	22.25	24.52	24.01	29.22	100.00
25 Years. 1853-1877.....	{ Number.....	10,824	11,930	11,434	14,325	48,513
	{ Percentage.....	22.31	24.60	23.60	29.49	100.00

It will be observed that the largest percentage of marriages occurred not only in the last quarter of the year 1878, but also in the percentage of the aggregate of the last quarters for the previous twenty-five years. This rule, which has prevailed so uniformly for so lengthened a term of years, has been variously accounted for. Doubtless the approach of the colder season, and the almost universal disposition to closer companionship during its continuance, aided by the increased social proclivities and warmer manifestations of sentiment and affection during the holiday season, contribute largely to the result.

It will also be observed that the smallest number of marriages, in any one of the quarterly divisions of the year, has been uniformly in the first quarter, during the whole period of registration. Considering the ecclesiastical sentiments of a large proportion of the population in regard to the performance of the ceremony of marriage during the Lenten season, and the largely increased ratio of the previous quarter (one extreme following another), it is not at all remarkable that the percentage is so much smaller for the first quarter.

#### NATIVITY OF PERSONS MARRIED.

The following Table shows the number of marriages, according to the nativity of the parties, for each of the last eleven years, and also for the aggregate of twenty years, from 1858 to 1877, inclusive:

TABLE XXVI.

BIRTH-PLACE.	1878.	1877.	1876.	1875.	1874.	1873.	1872.	1871.	1870.	1869.	1868.	20 years, 1858-77. Total.
United States.....	1,455	1,407	1,402	1,467	1,495	1,620	1,488	1,408	1,429	1,353	1,464	25,674
Foreign Countries.....	493	496	513	614	695	702	690	625	635	676	517	10,963
Am. groom, for. bride.....	181	177	144	191	154	138	155	157	126	99	135	2,410
For. groom, Am. bride.....	195	202	194	213	197	170	204	151	172	161	169	2,750
Not stated.....												64
Total.....	2,324	2,282	2,253	2,485	2,541	2,630	2,537	2,336	2,362	2,289	2,285	41,861

The number of marriages reported by nativity in 1878, shows an increase in those of purely American birth over the two previous years, 1876-1877, and also an increase in number in the class of American groom and foreign bride for the same time.

The number of marriages among parties of purely foreign birth has almost constantly decreased, from year to year, for the last decade; the three years last past having each a less number than any one of the first three in the ten years, and is smaller for the year 1878 than for any previous year since 1865.

The reason is obvious. The proportional number of adults of strictly foreign birth, among the so called foreign population, is rapidly decreasing; diminished by lessened immigration and by death.

The number of those in the periods of life in which the marriage relation is most frequently assumed, is fast diminishing from advancing age. The number of marriages of persons of purely foreign birth must, therefore, under the existing order of events, continue to decrease, while the number of those born of parents of foreign birth, but are of themselves of American birth, and rapidly attaining the marriageable age, are steadily increasing, and must continue to help swell the number of marriages of native citizens.

There has been a gradual increase in the number of mixed marriages, though in a somewhat irregular manner, during the whole period of the registration of the same. It is an evidence that the caste prejudice of nationality is gradually diminishing.

In the following Table are given the percentages of American, foreign and mixed marriages in several years, and in the aggregate for the twenty years, 1858 to 1877, inclusive. By *mixed* marriages are meant those where one party was of American and the other of foreign birth:

TABLE XXVII.

BIRTH PLACE.	1878.	1877.	1876.	1875.	1874.	1873.	1872.	1871.	1870.	1868.	1866.	1864.	20 yrs. Total.
United States	62.60	61.66	62.23	59.04	58.84	61.60	58.65	60.06	60.50	64.08	62.21	63.33	61.33
For. Countries	21.22	21.73	22.77	24.70	27.35	26.69	27.20	26.75	26.88	23.62	25.84	25.64	26.19
Mixed.....	16.18	16.61	15.00	16.26	13.81	11.71	14.15	13.19	12.62	13.30	11.95	11.03	12.48
Total.....	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

It will be observed that the number of marriages of persons of American birth, in 1878, is not only larger than in the two previous years, but that the percentage, in comparison with all others, is larger than for any year since 1868.

It will be seen, also, that the marriages of persons of foreign birth have gradually decreased in percentage as well as in number, while the marriages of those of mixed nativity have as gradually increased in percentage.

In comparison with the average of twenty years, the percentage of marriages of persons of strictly American birth is somewhat larger; the percentage of those of mixed nationality is larger by about 30 per

cent., while the percentage of marriages of persons of strictly foreign nativity has decreased nearly 20 per cent.

#### AGES OF PERSONS MARRIED.

The number of persons married in Rhode Island, during the year 1878, in the different periods of life, and the number of each sex, in each division of age, may be found in the following Table:

TABLE XXVIII.

1878.	Under 20.	20 to 25.	25 to 30.	30 to 35.	35 to 40.	40 to 45.	45 to 50.	50 to 55.	55 to 60.	60 to 65.	65 to 70.	70 to 75.	75 to 80.	Not stated.
Males.....	91	894	674	266	150	98	49	86	31	16	12	2	1	4
Females..	527	938	449	175	109	64	25	13	8	4	5	....	3	4
Total.....	618	1,832	1,123	441	259	162	74	49	39	20	17	2	4	8

The curiosities of matrimonial alliances continue to be exhibited from year to year. By reference to the Registration returns the eccentricities of taste in regard to conjugal companionship are strikingly presented. For instance, three men between 55 and 60 years of age married women between 20 and 25; three of same age, married women between 25 and 30, and four of same age, married women between 30 and 35. But of greater singularity, are the instances of eleven women between the ages of 35 and 40, marrying men between 25 and 30; three between the ages of 40 and 45, marrying men between 25 and 30; one woman between 45 and 50, married a man between 25 and 30; one woman between 50 and 55, married a man between 30 and 35; and one woman between 60 and 65, married a man between 40 and 45.

The following Table shows the number of persons married in Rhode Island, including both sexes, in each division of ages, in each of the last thirteen years, from 1866 to 1878, inclusive:

TABLE XXIX.

YEARS.	Under 20.	20 to 25.	25 to 30.	30 to 35.	35 to 40.	40 to 45.	45 to 50.	50 to 55.	55 to 60.	60 to 65.	65 to 70.	70 to 75.	75 to 80.	80 to 85.	Not stated.
1866. ....	693	1,981	1,025	419	213	127	81	50	25	21	12	7	....	....	23
1867. ....	696	1,886	1,104	416	211	148	91	48	37	18	18	5	3	1	6
1868. ....	644	1,835	1,050	432	219	133	82	61	30	29	11	8	4	....	32
1869. ....	642	1,814	1,051	468	227	134	79	46	35	15	11	2	3	2	49
1870. ....	744	1,883	1,084	415	216	159	86	64	26	24	12	3	2	....	6
1871. ....	697	1,914	1,118	392	228	115	73	56	35	22	6	7	3	....	6
1872. ....	786	2,073	1,182	434	237	131	81	61	43	21	13	6	1	....	5
1873. ....	762	2,177	1,156	507	253	140	87	68	35	24	12	6	6	....	27
1874. ....	770	1,992	1,179	459	268	159	101	52	36	39	8	9	1	....	9
1875. ....	681	2,058	1,108	475	252	150	101	60	32	29	13	4	1	....	6
1876. ....	691	1,741	1,041	450	224	154	80	53	27	19	12	8	2	....	9
1877. ....	631	1,745	1,118	459	244	125	92	52	46	14	15	11	2	1	9
1878. ....	618	1,832	1,123	441	259	162	74	49	39	20	17	2	4	....	8

The number of persons married in 1878, under twenty years of age, was less than in any one of the preceding twelve years; of those between 20 and 25 years there were 87 more than in 1877, and 91 more than in 1876. The number is larger than in 1877, in the third, fifth, sixth, tenth, eleventh, and thirteenth divisions of age. The number between 35 and 40 is the largest, with one exception, and between 40 and 45, without exception, in the last thirteen years; and between 70 and 75 the smallest, with one exception, for the same period.

## PROPORTION OF SEX.

The following Tables will show the percentages of males and females married, in each division of ages, in each of the last nineteen years:

TABLE XXX.

YEARS.		Under 25 25 to 30 30 to 35 35 to 40 40 to 45 45 to 50 50 & over							Total
MALES.	1860.....	5.0	42.5	36.3	16.3	5.7	3.3	20.00	
	1861.....	4.6	44.5	35.4	15.5	5.8	4.2	20.00	
	1862.....	4.2	37.8	27.9	18.3	5.9	5.9	20.00	
	1863.....	3.5	36.0	25.6	17.2	5.8	5.9	100.00	
	1864.....	4.3	36.8	27.3	17.9	7.4	4.3	100.00	
	1865.....	3.5	37.0	28.4	18.3	7.5	4.7	100.00	
	1866.....	5.3	40.9	27.0	15.4	6.3	4.1	20.00	
	1867.....	4.3	40.1	27.3	16.8	6.8	4.1	100.00	
	1868.....	4.1	39.9	28.2	17.1	6.1	4.6	100.00	
	1869.....	4.3	39.6	27.7	18.5	6.1	3.8	100.00	
	1870.....	4.6	40.4	28.1	16.0	6.4	4.3	100.00	
	1871.....	5.3	40.1	28.3	16.5	4.9	4.3	100.00	
	1872.....	4.3	41.3	28.2	16.6	5.2	4.4	100.00	
	1873.....	3.9	42.4	28.7	17.0	6.0	4.1	100.00	
	1874.....	4.1	40.4	27.2	17.5	6.4	4.4	100.00	
	1875.....	3.5	40.9	27.8	17.5	6.1	4.2	100.00	
	1876.....	5.1	37.5	28.6	17.9	5.6	4.3	100.00	
	1877.....	4.3	36.0	30.2	18.7	5.9	4.9	100.00	
	1878.....	3.9	38.5	29.0	18.0	6.3	4.3	100.00	



TABLE XXXI.

	YEARS.							Total.
		Under 20.	20 to 25.	25 to 30.	30 to 40.	40 to 50.	50 & over.	
FEMALES.	1860.....	25.8	44.1	17.0	9.1	2.6	1.4	100.00
	1861.....	29.6	42.0	15.2	7.8	4.1	1.3	100.00
	1862.....	24.9	41.3	16.7	11.8	4.1	1.2	100.00
	1863.....	24.9	42.6	16.9	9.8	4.1	1.7	100.00
	1864.....	24.2	43.4	17.8	10.3	2.9	1.4	100.00
	1865.....	22.6	42.3	19.1	11.0	3.5	1.5	100.00
	1866.....	24.7	42.9	17.4	11.0	2.7	1.3	100.00
	1867.....	25.4	40.5	19.3	10.0	3.4	1.4	100.00
	1868.....	24.4	40.9	18.1	11.6	3.3	1.7	100.00
	1869.....	24.1	40.5	18.7	12.1	3.4	1.2	100.00
	1870.....	26.8	39.4	17.9	10.8	3.9	1.2	100.00
	1871.....	24.6	41.9	19.1	10.1	3.1	1.2	100.00
	1872.....	26.7	40.5	18.4	9.9	3.2	1.3	100.00
	1873.....	25.3	40.8	17.5	12.0	2.7	1.7	100.00
	1874.....	26.3	38.1	19.3	11.1	3.9	1.3	100.00
	1875.....	23.9	42.1	16.8	11.8	4.0	1.4	100.00
	1876.....	25.6	39.8	17.6	12.0	3.7	1.3	100.00
	1877.....	23.4	40.4	18.8	12.1	3.6	1.7	100.00
	1878.....	22.7	40.4	19.3	12.2	3.8	1.6	100.00

The great difference between the number of males and the number of females who enter the marriage state under the age of 20 years, as shown in the above Tables, will not fail to be noticed. In the year 1878, for every 4 males married under 20 years of age, there were nearly 23 females married under the same age.

In the second division, i. e. from 20 to 25 years of age, the percentages for 1878 approximate very closely, standing about 38 males to 40 females. In the third division, i. e. from 25 to 30, they again diverge, standing for the same year at about 150 males married to each 100 females. The same proportion also holds for the division of ages from 30 to 40. After 40 years of age, the percentage of males married increases to one, two, and in some years, even three hundred per cent. above that of females.

Of all the persons married during any one of the last nineteen years, there has been no year in which there were as many as six males, above 50 years of age married, in each 100 marriages; nor any year in which there were as many as two females, above the same age, married, in each 100 marriages.

#### COLORED MARRIAGES.

There were 80 marriages of persons of color in Rhode Island during the year 1878.

The whole number is 16 larger than in 1877, and 21 larger than in 1876. It may be of interest to see what the proportion of colored persons married in 1876, 1877 and 1878, bears each year to the whole number of colored persons in the State, and also the proportions of the same compared with the proportions which the whole number of persons married bears to the whole population of the State, for the same periods of time.

	1878.	1877.	1876.
Ratio of whole number of persons married to whole population of the State.	One in every	One in every	One in every
.....	55.7	56.6	57.3
Ratio of colored persons married to whole of colored population in the State.	.....	.....	.....
.....	39.1	49.0	53.1

It will be seen by the above comparisons, that the ratio of marriage to population, according to the Census of 1875, has steadily increased during the last three years, in both white and colored classes of the population, and that the increase has been much the largest in the colored population. Indeed it is doubtless true that the marriage rate of the whites, has not increased as fast as the population. A further consideration of the status of the colored population, in regard to the proportion of births, marriages and deaths, will be given in the chapter devoted to the statistics of mortality.

## DIVORCES, 1878.

The question of divorce has no direct relation to the status of the public health, but has always a place in the compilation of vital statistics, and has also an element of interest to all, from its connection with the marriage relations of the people.

The number of applications for divorce, in 1878, was 258; which was 1 more than in 1877.

The following Table shows the number of divorces granted in each county, and in the whole State, in each of the last ten years, with the proportion of marriages to each divorce granted, in each year:

TABLE XXXII.

YEARS.	Bristol County.		Kent County.		Newport County.		Providence County.		Washington County.		Whole State.	
	Divorces Granted.	Marriages to one Divorce.	Divorces Granted.	Marriages to one Divorce.	Divorces Granted.	Marriages to one Divorce.	Divorces Granted.	Marriages to one Divorce.	Divorces Granted.	Marriages to one Divorce.	Divorces Granted.	Marriages to one Divorce.
1869 .....	10	10.6	15	12.5	6	27.7	120	13.8	11	15.5	162	14.1
1870 .....	8	27.7	18	11.8	6	26.3	152	11.3	21	9.3	200	11.8
1871 .....	5	16.8	11	17.9	4	49.7	123	13.3	18	11.4	161	14.5
1872 .....	8	10.2	13	15.7	8	22.9	149	12.6	22	8.9	200	12.7
1873 .....	6	16.2	22	9.8	8	21.9	131	14.8	6	33.7	173	15.2
1874 .....	10	8.9	20	8.0	6	29.0	190	10.0	16	11.6	242	10.5
1875 .....	2	50.0	18	8.8	7	23.4	120	14.9	11	20.5	158	15.7
1876 .....	6	14.5	15	12.8	7	20.5	148	11.1	20	8.8	190	11.5
1877 .....	7	12.0	9	16.3	7	26.0	134	12.4	21	9.9	178	12.8
1878 .....	4	26.0	11	13.3	13	12.8	156	10.9	12	17.3	196	11.9

The number of divorces granted in 1878, was 18 larger than it was in 1877; and the proportion of marriages to divorces was slightly decreased.

## DEATHS, 1878.

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The number of deaths reported in the State of Rhode Island during the year 1878, was 4,441. This number is less than that of 1877, by 9 only, and is larger than any previous year, with the exception of 1877.

The rate of mortality for the year, as already given on page 60, was one to every 58.10 of the population, according to the Census of 1875, or at the rate of 17.20 in each thousand.

By reference to Table XII, page 63, the difference between the previous three years can be readily seen. The percentage and death rate, are almost precisely what they were in 1877, but differ more with the smaller number of 1876, when the death rate was one decedent to every 62.7 of the population, or 15.9 in each one thousand.

It may be of interest to the reader, to contrast the number of deaths in the city of Providence, with those that occurred in the rest of the State, for the purpose of showing the difference in the rate of mortality, between city life under favorable circumstances, and life in villages and rural districts.

In order to bring before the eye in a more direct manner, the comparisons alluded to, the following synopsis for the years 1876, 1877 and 1878, is presented:

	Population.	Number of deaths.	One death in every	In each 1,000.	
1876.	Providence City.....	100,675	1,865	54.00.....	18.50
	Rest of State.....	157,564	2,251	70.00.....	14.28
	Whole State.....	258,239	4,116	62.70.....	15.90
1877.	Providence City.....	100,675	1,938	51.90.....	19.25
	Rest of State.....	157,564	2,512	62.70.....	15.94
	Whole State.....	258,239	4,450	58.30.....	17.20
1878.	Providence City.....	100,675	1,969	50.62.....	19.69
	Rest of State.....	157,564	2,452	64.26.....	15.56
	Whole State.....	258,239	4,441	58.10.....	17.20

The observation has been frequently made, that the difference in mortality between the city and State, shown by the statistics of deaths as reported from the towns, could not be relied upon as entirely correct. It is believed that many of the villages of the State have quite as insalubrious surroundings as any parts of the city of Providence; and, although it is known that in the rural districts, at least, the percentage of children, in whom the mortality is largest, is much smaller than in the city, still, the rate of mortality could scarcely show so much disparity, if the whole number of deaths outside of the city, were fully reported.

There are three towns which reported a higher death rate for 1878, than the city of Providence, viz.: Warren, Woonsocket and East Providence. Doubtless the whole number of deaths in these towns were reported.

Doubtless, also, several of those towns showing a very small death rate, report the whole number of deaths, and especially the *towns* of Newport county, with a rate of only 9.5 in each one thousand. The failure to return the whole number of deaths, occurs mainly in those towns having a large manufacturing population, among which frequent removals are almost the rule, rather than exception, and where burial permits are not required. It is very certain that there will never be anything like complete returns of deaths, until burial permits are required in every town in the State.

#### SEX OF DECEDENTS.

Of the 4,441 persons, whose deaths were returned during the year 1878, 2,161 were males, and 2,280 were females; the ratio standing at 94.78 males to each 100 females, or 48.66 males, and 51.34 females in each 100 decedents.

The following Table shows the number and proportion of males and females among the decedents, and also among the children born in Rhode Island, during the ten years, 1853 to 1862, inclusive; also in each of the sixteen years from 1863 to 1878, inclusive, and for the entire period of twenty-six years:

TABLE XXXIII.

DEATHS.	10 years, 1853-1862.....	10,980 males.....	11,269 females.....	or 96.9 males to 100 females.
	1863.....	1,621 males.....	1,586 females.....	or 102.2 males to 100 females.
	1864.....	1,633 males.....	1,727 females.....	or 94.5 males to 100 females.
	1865.....	1,686 males.....	1,719 females.....	or 98.1 males to 100 females.
	1866.....	1,497 males.....	1,473 females.....	or 101.6 males to 100 females.
	1867.....	1,442 males.....	1,447 females.....	or 99.7 males to 100 females.
	1868.....	1,413 males.....	1,499 females.....	or 94.3 males to 100 females.
	1869.....	1,696 males.....	1,686 females.....	or 100.6 males to 100 females.
	1870.....	1,588 males.....	1,650 females.....	or 96.2 males to 100 females.
	1871.....	1,621 males.....	1,723 females.....	or 94.1 males to 100 females.
	1872.....	2,118 males.....	2,129 females.....	or 99.4 males to 100 females.
	1873.....	2,166 males.....	2,337 females.....	or 95.5 males to 100 females.
	1874.....	2,111 males.....	2,118 females.....	or 99.7 males to 100 females.
	1875.....	2,108 males.....	2,309 females.....	or 99.4 males to 100 females.
	1876.....	1,969 males.....	2,147 females.....	or 91.7 males to 100 females.
	1877.....	2,132 males.....	2,318 females.....	or 92.0 males to 100 females.
	1878.....	2,161 males.....	2,280 females.....	or 94.8 males to 100 females.
	26 years.....	39,892 males.....	41,317 females.....	or 96.8 males to 100 females.

TABLE XXXIV.

BIRTHS.	10 years, 1853-1862.....	18,377 males.....	17,260 females.....	or 106.4 males to 100 females.
	1863.....	1,892 males.....	1,788 females.....	or 105.8 males to 100 females.
	1864.....	1,940 males.....	1,942 females.....	or 100.3 males to 100 females.
	1865.....	2,096 males.....	1,857 females.....	or 112.9 males to 100 females.
	1866.....	2,546 males.....	2,356 females.....	or 108.1 males to 100 females.
	1867.....	2,655 males.....	2,464 females.....	or 107.7 males to 100 females.
	1868.....	2,745 males.....	2,627 females.....	or 104.5 males to 100 females.
	1869.....	2,685 males.....	2,560 females.....	or 104.9 males to 100 females.
	1870.....	2,679 males.....	2,536 females.....	or 105.6 males to 100 females.
	1871.....	2,878 males.....	2,800 females.....	or 102.8 males to 100 females.
	1872.....	3,085 males.....	3,058 females.....	or 100.9 males to 100 females.
	1873.....	3,135 males.....	2,887 females.....	or 108.6 males to 100 females.
	1874.....	3,311 males.....	3,155 females.....	or 104.9 males to 100 females.
	1875.....	3,362 males.....	3,146 females.....	or 106.9 males to 100 females.
	1876.....	3,291 males.....	3,088 females.....	or 106.8 males to 100 females.
	1877.....	3,163 males.....	3,072 females.....	or 103.0 males to 100 females.
	1878.....	3,402 males.....	3,312 females.....	or 102.7 males to 100 females.
	26 years.....	63,251 males.....	59,858 females.....	or 105.7 males to 100 females.

There were 29 more males, and 38 less females, among the decedents of 1878, than in the year 1877, and the proportion of males to females

was greater, and thereby more nearly equal as compared with the preceding year.

Among the children born there were 239 more males, and 240 more females than in 1877, the inequality of proportion being less than in the previous year, or in any previous year, with the exception of 1864, and 1872.

It will be noticed upon examination of the above Tables, that in the aggregate for the twenty-six years, and also in all of the separate years given, with two or three exceptions, there has been an excess of females among the decedents, and an excess of males among the children born.

A natural inference would be, that the male portion of the population must be largely in excess of the female portion, and annually increasing.

By reference to Table V, page 28, it will be seen, however, that by the Census of 1875, the females exceeded the males in the population of the State, by 7,119. The difference must be accounted for on the supposition of a larger proportional emigration of native males from the State.

#### SEASON AND MORTALITY.

The whole number of decedents, and the sex of the same, in each month of the year 1878, and in each division of the State, may be found in Table IV, on the 23d page.

The influence of season upon mortality, may be further illustrated by the following Table, which shows the number and percentage of deaths, in each quarter of each of the last five years, and in the aggregate for the twenty-one years, from 1853 to 1873, inclusive.

TABLE XXXV.

SEASON.	1878.		1877.		1876.		1875.		1874.		1853-1873.	
	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
January—March...	1,158	25.87	986	21.03	948	23.08	1,101	25.50	977	23.10	13,784	23.12
April—June.....	968	21.81	958	21.53	942	22.89	912	21.13	1,045	24.71	12,656	21.23
July—September...	1,175	26.46	1,317	29.60	1,249	30.34	1,344	28.82	1,185	28.02	18,469	30.98
October—December	1,140	25.86	1,239	27.84	977	23.74	1,080	24.55	1,022	24.17	14,708	24.67
Total.....	4,441	100.00	4,450	100.00	4,116	100.00	4,317	100.00	4,229	100.00	59,617	100.00

It will be observed that the percentage of mortality, in 1878, was greater than that of 1877, in the first two quarters of the year, and less in the last two quarters. It was also greater in the first quarter of 1878, than in the first quarter of either of the previous four years, and greater than the average percentage of the same season, for the twenty-one years preceding 1874. The percentage of the third quarter for 1878, although following the rule of being larger than in any other quarter, was less than in the same quarter of any one of the previous four years, and also considerably less than the average of the same quarter for the twenty-one years preceding 1874.

The percentage of the fourth quarter, as will be seen, was less than the first, which is contrary to the general rule; and quite reverses the proportions of 1877, in which the last quarter had a very large percentage in excess of the first.

It may be of interest to contrast the city of Providence, which comprises about two-fifths of the entire population of the State, with the rest of the State, in regard to the influence of season upon mortality.

The following Table will present a comparison between the city and rest of the State, in relation to the mortality of each section by seasons.

It will show the number and percentage of deaths in each quarter of the year 1878, in the city, and in the rest of the State separately; and also the percentage of deaths in each quarter of the year, in the city of Providence, for twenty-four years, from 1855 to 1878, inclusive; and in the whole State, including the city, for twenty-six years, from 1853 to 1878, inclusive:



TABLE XXXVI.

SEASON.	1878.				1855-1878.		1853-1878.	
	Providence.		Rest of State.		Providence.		Whole State.	
	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
January—March:.....	541	27.19	617	25.16	7,519	23.89	18,904	23.28
April—June.....	423	21.28	545	22.22	6,909	21.98	17,481	21.53
July—September.....	520	26.14	655	26.71	9,353	29.76	24,639	30.37
October—December.....	505	25.39	635	25.91	7,683	24.42	20,146	24.82
Total.....	1,989	100.00	2,452	100.00	31,464	100.00	81,170	100.00

A contrast between the city of Providence and the rest of the State, in regard to *habits* and *modes* of life, does not present such marked differences as, perhaps, might be expected. The great proportional number, and near contiguity of the villages of Rhode Island, with their facility of access, and the frequent communication of residents therein with each other, and with the city of Providence, make the entire population more homogeneous in character than that of any other State. Then the city of Newport, and several villages large enough for incorporation into cities, and a considerable number but little less in size, present all the essential conditions of city life in their sanitary relations, as well as in the customs and modes of living of the inhabitants. Under these circumstances, it would not be expected that there would be any great difference in the percentage of mortality, in the same quarters of the year, between the city of Providence and the rest of the State, in the average of a series of years.

An examination of Table XXXVI will show that such is the fact. While there are considerable differences in some years, between the city and rest of the State, and between the city and the whole State, including the city, in the same quarters, it will be seen, that for a period of twenty-four or more years, the average percentage in the same quarters, between the city and the whole State does not in any instance reach as high as three-quarters of one per cent.

Of course the exact difference is not shown, because the death statistics of the city are merged in those of the State, but the result is sufficiently conclusive in establishing the fact that whatever difference there may be, it does not exceed one per cent. in the average of any lengthened period of time.

As before observed, for single years there may be considerable differences, as in the year 1878, in which it will be noticed that in the first quarter, the difference between the city and rest of the State was 2.03 per cent. in favor of the rest of the State, while in the remaining three quarters the difference was in favor of the city as follows:—2d quarter 0.94 per cent.; 3d quarter 0.57 per cent.; 4th quarter 0.52 per cent.

The following summary shows the order of the months in which occurred, from the largest to the smallest number of deaths in the whole State, in each of the last five years:

	1878.	1877.	1876.	1875.	1874.
1	December... 421	September.. 454	August..... 469	August.... 471	August..... 496
2	August..... 420	August.... 450	July..... .. 444	September.. 419	September.... 396
3	July..... .. 410	October.... 430	December.. 348	February... 392	April..... .. 384
4	January.... 400	July..... .. 413	March..... 341	January... 363	July..... .. 363
5	March ... .. 396	December.. 411	September. 336	December.. 358	October..... 359
6	November.. 377	November.. 398	October.... 334	November.. 357	May..... .. 352
7	February.... 363	March..... 347	May..... .. 332	July..... .. 354	January..... 351
8	April..... .. 350	May..... .. 343	April..... .. 329	March. .... 346	December.... 339
9	September.. 345	January.... 323	February... 312	October.... 345	November.... 324
10	October..... 342	April..... 310	January.. .. 295	May..... .. 333	March..... .. 320
11	June..... .. 310	June..... .. 305	November.. 295	April..... 314	June..... .. 309
12	May..... .. 308	February... 296	June..... .. 281	June..... 265	February.... 306
	4,441	4,450	4,116	4,317	4,229

For the first time since 1864, in which year the summarising by order of months and highest mortality commenced, December takes first place. This bad eminence has almost invariably been held by August, and was in 1878 displaced by only a single death. The change of place, however, has not occurred solely from an increased number of deaths in December, but in a larger degree to a decreased number of deaths in August as compared with the year 1877. There was no largely increased mortality from any one disease in December 1878, with the exception of Pneumonia, but in August the decrease in the number of deaths from cholera infantum and diarrhoea was 40 per cent. less than in 1877.

It will be noticed that September, which took first position in 1877, fell to the ninth in order in 1878, the falling off in the deaths from cholera infantum and diarrhoea in that month as compared with the same in 1877, was more than 60 per cent. As usual, October, May and June, take low places.

The following summary taken from the report of the City Registrar of Providence for 1878, will show the number of deaths and the months in the order of highest occurrence of the same according to percentage in the city of Providence, in the aggregate of deaths for twenty-three years, from 1856 to 1878 inclusive:

TABLE XXXVII.

TWENTY-THREE YEARS. 1856-1878.	American Percentage		Foreign Percentage		Total American and Foreign.
	Number of Deaths.		Number of Deaths.		Number of Deaths.
1. August.....	1,499	1. August.....	1,733	1. August.....	3,232
2. July.....	1,357	2. July.....	1,634	2. July.....	2,981
3. September.....	1,341	3. September....	1,460	3. September....	2,801
4. January.....	1,340	4. October....	1,303	4. December....	2,531
5. December....	1,314	5. November....	1,218	5. January....	2,506
6. March.....	1,276	6. December....	1,217	6. October.....	2,488
7. April.....	1,254	7. April.....	1,186	7. April.....	2,440
8. February.....	1,225	8. January.....	1,166	8. March.....	2,438
9. November....	1,215	9. March.....	1,163	9. November....	2,433
10. October.....	1,185	10. February....	1,137	10. February....	2,362
11. May.....	1,165	11. May.....	1,081	11. May.....	2,246
12. June.....	985	12. June.....	1,030	12. June.....	2,015
Total.....	15,156	Total.....	15,317	Total.....	30,473

The above synopsis shows very clearly in the third column the order of the months in which the total deaths have occurred, from the highest to the lowest number of the same in the city for a long series of years. It does not differ materially in the order of months from a summary of the same kind for the whole State for a long period of years.

It will be noticed, however, that the two classes of parentage differ somewhat in agreement with each other, and with the monthly order of mortality in the total number of deaths.

The agreement between the two classes of parentage is complete, the one with the other for just half the months of the year. The agreement of each class of parentage with the order of total number is complete for seven months in the twelve.

#### PARENTAGE OF DECEDENTS.

The whole number of decedents reported in Rhode Island in 1878, was 4,441 of which 2,281 were of American parentage, and 2,160 were of foreign parentage. The parentage was reckoned according to the reported nativity of the fathers.

A general abstract of deaths by parentage in the several towns in the State will be found in Table I on pages 18 and 19.

There were no decedents of foreign parentage reported in 1878 from six towns in the State, and in eight towns, the number of decedents of foreign parentage were 3 or less.

There were seven towns in which the number of decedents of foreign parentage exceeded those of American. In Cranston, the numbers were equal. In Burrillville, there were twice as many of foreign parentage as of American; in Cumberland, nearly twice as many; in Lincoln, two and one-quarter times as many, and in Woonsocket nearly three times as many.

In Providence city, the decedents of foreign parentage exceeded those of American by 211, or about 123 of foreign to each 100 of American parentage.

The following Table gives the number and percentage of decedents of American and of foreign parentage, in each of the last five years, and in the aggregate for twenty years previous to 1878, or from 1858 to 1877 inclusive:

TABLE XXXVIII.

PARENTAGE.	1878.		1877.		1876.		1875.		1874.		1868-1877.	
	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
American.....	2,281	51.36	2,279	51.21	2,150	52.34	2,466	57.12	2,282	54.10	38,590	57.60
Foreign.....	2,160	48.64	2,171	48.79	1,966	47.76	1,851	42.88	1,947	45.90	28,429	42.40
Total.....	4,441	100.00	4,450	100.00	4,116	100.00	4,317	100.00	4,229	100.00	67,009	100.00

It will not fail to be noticed upon examination of the above Table, that the difference in number and percentage between the decedents of American and foreign parentage has been steadily lessening. Previous to 1877, the percentage of decedents of foreign parentage had not *averaged* for the period of nineteen years as high as 42.00 per cent. It will now be seen that the foreign percentage has *averaged* more than 46.00 per cent. for the last five years and has nearly reached 49.00 per cent. during the years 1877 and 1878.

## AGE OF DECEDENTS.

A statement of the aggregate and average age, of all the reported decedents of each sex, in each town and county in the State in 1878, may be found in Table I, on pages 18 and 19.

It will there be seen that the average age of all the male decedents in 1878, was 29.02 years, and the average age of all the female decedents, was 31.11 years.

The average age of all the male decedents in 1877, was 29.25 years, and of female decedents, 31.56 years. The highest average age of male decedents, in any town in the State in 1878, was 62.00 years, in New Shoreham; the lowest average age of male decedents in same year, was 11.33 years, in Middletown. The highest average age of female decedents in 1878, was 83.00 years, in Jamestown, and the lowest average of females, was 7 25 years, in North Providence. The averages for single years in towns having a small population, have very little value as indicating the relative longevity of the inhabitants.

When the deaths are few in number, they may happen in the same year to be of elderly people of one sex, and of a youthful age in the

other. And in the different years the decedents may be of advanced age in both sexes in one year, and of earlier age in another year. As in Jamestown in 1878, there was one female decedent only, aged 83 years, and three male decedents whose average age was 57 years, while in the same town in 1877, the average age of male decedents was 5 years, there being but one death among the males, and the average age of female decedents in 1876, was 16 years, there being two female decedents. But when aggregated in counties, and in towns of large population the averages from year to year do not very widely differ.

In the city of Providence, the average age of male decedents, in 1878, was 24.22 years, the average age of female decedents 27.88 years. The average age of total male and female decedents in the city was 26.09 years.

The following Table shows the average age of the decedents, in each of the larger divisions of the State, in each of the last five years, and also in the aggregate of each of four periods of five years each, comprising the twenty years from 1858 to 1877, inclusive:

TABLE XXXIX.

DIVISIONS OF THE STATE.	1878.	1877.	1876.	1875.	1874.	1873-1877. 5 years.	1868-1872. 5 years.	1863-1867. 5 years.	1858-1862. 5 years.
Bristol County .....	29.06	32.19	39.53	29.90	33.09	33.61	35.12	34.78	35.56
Kent County.....	33.68	35.78	39.39	35.77	32.06	36.90	34.77	35.81	32.15
Newport County.....	39.06	43.96	39.17	45.94	43.94	40.68	40.04	33.54	35.01
Providence Co., Towns.	30.96	28.16	31.69	30.19	28.66	28.46	25.26	29.16	23.44
Providence City.....	26.09	27.74	28.41	28.57	26.90	27.19	25.45	28.50	25.78
Washington County....	42.34	43.68	43.09	37.17	40.78	41.14	39.67	30.87	34.21
Whole State.....	30.09	30.45	32.37	31.27	29.86	30.28	31.66	30.75	29.42

As will be seen by Table XXXIX, the average age of the total decedents of the State, in 1878, was not only less than the average in 1877, but was less than in either of the three preceding years, and also less than the average for the previous twenty years. The difference, however, in the average age of total decedents, in any one year with another, or with any period of years, has not exceeded the limits of the last three years.

In the counties, as previously remarked, the differences, for obvious reasons, are quite considerable, although less than in most years.

#### PERCENTAGES OF DECEDENTS AT DIFFERENT AGES.

In Table V, on pages 24 to 29, inclusive, will be found the number of deaths in 1878, in each town and each county, of each sex, and in each period of life, with the percentage of the whole number of deaths in each division, to the population of the same.

The following Table shows the percentages of decedents in each division of ages in each of the last ten years, and in the aggregate for two periods: one of ten years and seven months, from June 1st, 1852, to December 31st, 1862, inclusive; the other of ten years, from 1863 to 1872, inclusive:

TABLE XL.

PERIODS OF LIFE.	1878.	1877.	1876.	1875.	1874.	1873.	1872.	1871.	1870.	1869.	10 yrs. 1863- 1872.	10 yrs. 7 mos. 1852- 1862.
Under 1 year....	16.6	17.4	19.5	20.8	19.9	19.8	22.8	18.8	20.0	17.8	18.0	17.6
1 and under 2....	8.1	8.1	7.4	6.8	7.8	9.2	8.0	6.1	7.2	8.1	7.8	9.8
2 and under 5....	10.3	9.5	7.0	7.0	9.4	8.1	5.5	6.7	6.2	8.8	7.9	9.6
Total under 5....	35.0	35.0	33.9	34.6	37.1	36.6	36.3	31.6	33.4	34.7	33.7	37.0
5 and under 10...	6.2	6.2	4.2	4.0	5.7	5.3	2.7	3.3	3.3	5.7	4.6	5.0
10 and under 20...	6.1	5.4	5.2	5.5	6.0	6.9	6.5	5.5	6.6	6.9	6.2	5.8
20 and under 30...	8.8	8.9	9.1	9.6	8.7	9.1	9.9	10.2	10.3	8.8	9.7	9.5
30 and under 40...	7.6	7.5	7.7	7.9	6.9	7.8	8.5	8.4	7.9	6.8	8.1	8.7
40 and under 50...	6.4	6.6	6.9	7.7	6.8	6.5	7.3	7.5	7.1	7.4	7.2	7.5
50 and under 60...	7.6	7.2	7.5	7.4	7.0	6.4	6.7	7.6	7.3	7.9	7.3	6.7
60 and under 70...	7.9	8.8	9.3	8.6	7.8	7.6	8.2	8.9	8.5	8.1	8.3	6.9
70 and under 80...	8.8	9.5	9.8	8.4	8.1	8.3	7.7	9.8	9.1	8.1	8.4	7.3
80 and under 90...	4.8	4.0	5.2	5.0	4.7	4.5	5.4	6.0	5.7	4.7	5.4	4.6
90 and over.....	0.8	0.9	1.2	1.3	1.2	1.0	0.8	1.2	0.8	0.9	1.1	1.0
Total.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

In Table XXXIX, it was shown that the average age of the total decedents in Rhode Island, in 1878, was less than in either of the previous three years. The lessened average age in any year, is usually owing to the larger decedence of childhood and youth.

As compared with the previous year, the slightly lessened rate of mortality in 1878, was not owing to a smaller number of deaths among children of five years and under, as usual, but principally, as will be seen in Table XL, to an increased mortality between the ages of 10 and 20.

The results of a single year, however, or of two or three years, have little value in arriving at definite conclusions. The occurrence of one or more epidemics in one year, affecting children chiefly, and the occurrence in another year of epidemics affecting adults chiefly, or all ages alike, would make great differences in the ratio of mortality in the different periods of life, in short terms of years. But in periods of twenty years, or more, the results may be considered as reasonably conclusive.

It will be seen by the preceding Table, that the average percentage of mortality of children of five years of age and under, in Rhode Island, for a period of sixteen years, has not exceeded 36 per cent. This is a low rate as compared with the statistics of some other States, in which the rate is stated to be as high as from 40 to 42 per cent.

The different localities of the State also present marked differences in the percentage of mortality in the different divisions of age, as well as in the average age.

In the strictly rural districts, where the proportion of children to the adult population is much less than in the larger villages and cities, where the most of those in the child-bearing periods of life gravitate, the average age is not only larger for a series of years, but the percentage of mortality in the earlier years of life is relatively much smaller.

In order to show concisely the differences alluded to in the above remarks, the following representative sections of the State are presented, and the percentages of decedents, in 1878, in the different periods of life in those towns, are contrasted; and in the city of Providence a contrast of the same, between the different general classes of the population.

It is understood the percentages are the ratios of the number of decedents in each of the divisions of age, compared with the whole number of decedents, in the respective towns, and not with the population.



1878.		Under 1 year.	Under 5 years.	5 to 20.	20 to 50.	50 & over.
		Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
State of Rhode Island,	Males.....	9.3.....	18.6.....	5.3.....	10.2.....	14.6—48.7
	Females.....	7.3.....	16.4.....	7.0.....	12.6.....	15.3 51.3
Total.....		16.6	35.0	12.3	22.8	29.9
						100.0
Jamestown.....		00.0.....	00.0.....	00.0.....	25.0.....	75.0
						100.0
New Shoreham..		11.0.....	11.0.....	00.0.....	11.0.....	78.0
						100.0
Foeter.....		06.0.....	06.0.....	00.0.....	25.0.....	69.0
						100.0
Warren.....		10.6.....	35.3.....	20.0.....	21.0.....	23.7
						100.0
Woonsocket.....		27.5.....	41.8.....	10.8.....	23.7.....	23.7
						100.0
City of Providence,	Am. Parentage.....	8.45.....	16.44.....	5.60.....	8.80.....	13.88 44.72
	For. Parentage.....	10.81.....	23.58.....	7.12.....	14.33.....	10.25 55.28
Total Percentage.						
Providence.....		18.76.....	40.02.....	12.72.....	23.13.....	24.13
						100.0

The above summary will serve to show how greatly the percentages differ in the different towns in the different divisions of age; and in the city of Providence, the difference in the percentages of the two principal classes of the population.

In the town of Jamestown it will be seen that there were no deaths in 1878, of persons under twenty years of age, and that, therefore, the percentage would necessarily be large in the later periods of life.

The difference of percentage under one year of age, varies from .00 in the town of Jamestown, to 27.5 in the town of Woonsocket.

Under five years of age the average percentage to whole number of decedents, in the whole State, was 35.0 per cent., and which was the same as in 1877; under one year of age, 16.6 per cent. or 0.8 per cent. less than in 1877.

The high death rate of 41.8 per cent. of persons under five years of age in Woonsocket, leads all others, in 1878, although less by 1.19 per cent. than in 1877. The percentage of Providence city, 40.2 per cent., is considerably larger than in 1877.

The difference between Providence and Woonsocket, in the percentage of decedents under one year of age, in 1878, is quite remarkable, that is, Woonsocket, 27.5 per cent.; Providence, 18.76 per cent., or 8.74 per cent. less.

In both towns more than one-half of all the deaths was of persons not over twenty years of age, and more than four-fifths of that proportion, of persons under five years of age. The difference in the percentages of the decedents under five years of age, of American parentage and of foreign parentage, in the city of Providence, will be noticed. This difference, 7.14 per cent., in 1878, is less than in either of the two preceding years.

Of decedents 50 years of age, and over, the percentage varies from 23.7 in Warren and Woonsocket, to 78.0 per cent. in New Shoreham.

#### COLORED DECEDENTS.

Considerable public interest has been manifested in the question, whether the colored race was self-sustaining, in regard to population, in the colder latitudes of America. A comparison of the births and deaths among this class of people, for a long series of years, in the different States, will be of value in obtaining correct conclusions.

In the State of Rhode Island there is a large proportional number of colored people, as compared with other Eastern States, and the statistics in regard to births, marriages and deaths among them, have, for obvious reasons, been reported separately for a considerable number of years.

The number of deaths among the colored population, in 1878, was 156, or four less than in 1877.

*Sex.*—Of the 156 colored decedents, 63 were males and 93 females.

*Season.*—These 156 deaths were in the different months, as follows:

Months.	Deaths.	Months.	Deaths.	Months.	Deaths.	Months.	Deaths.
January.....	15	April.....	17	July.....	19	October.....	16
February.....	11	May.....	9	August.....	12	November.....	8
March.....	12	June.....	9	September.....	8	December.....	20
1st Quarter.....	38	2d Quarter.....	35	3d Quarter.....	39	4th Quarter.....	44

First six months, 73; second six months, 83. Total, 156.

*Age.*—The average age of the colored decedents in Rhode Island, in 1878, was as follows:

	Providence City.	Rest of State.	Whole State.
Colored Males.....	16.88 years.....	38.21 years.....	21.66 years.
Colored Females.....	31.07 years.....	33.46 years.....	31.97 years.

## SUMMARY OF COLORED POPULATION.

The number of births, marriages and deaths among the colored population of Rhode Island, in the several divisions of the State, in 1878, is given in the following Table, compared with the colored population in each division, as found by the State census of 1875:

TABLE XII.

COUNTIES.	Colored Population, 1875.	BIRTHS, 1878.		MARRIAGES, 1878.		DEATHS, 1878.	
		Number.	To population one birth in	Number.	Of population one person married in	Number.	Of population one death in
Bristol County.....	249	8	31.1	..	..	6	41.5
Kent County.....	365	6	60.8	4	45.6	7	52.1
Newport County.....	1,021	27	37.8	10	51.0	17	60.0
Providence County, Towns.....	428	9	47.0	5	42.3	9	47.0
Providence City.....	3,487	104	33.5	54	32.3	106	32.9
Washington County.....	736	18	40.9	7	51.8	11	66.0
Whole State.....	6,271	172	36.4	80	39.2	156	40.2

In 1877, the proportions among the colored population were as follows: One birth in 37.3; one person married in 49.0; one death in 39.2.

The difference between the white and colored population, in the vital statistics of the year 1878, was as follows:

Whites.....One child born in 38.5; one person married in 56.1; one death in 58.8.  
Colored.....One child born in 36.4; one person married in 39.2; one death in 40.2.

In regard to births and marriages, the numbers are larger in proportion to the population, among the colored than among the whites; and there was also a larger proportion of deaths among the former than among the latter.

The following summary shows the number of births, marriages and deaths among the colored population of Rhode Island in each of the last eighteen years, from 1861 to 1878, inclusive:

## COLORED POPULATION.

1861.....	97 births.....	30 marriages.....	109 deaths.
1862.....	96 births.....	23 marriages.....	90 deaths.
1863.....	73 births.....	68 marriages.....	104 deaths.
1864.....	69 births.....	35 marriages.....	121 deaths.
1865.....	87 births.....	51 marriages.....	129 deaths.
1866.....	124 births.....	65 marriages.....	123 deaths.
1867.....	144 births.....	61 marriages.....	105 deaths.
1868.....	147 births.....	84 marriages.....	111 deaths.
1869.....	136 births.....	70 marriages.....	133 deaths.
1870.....	158 births.....	70 marriages.....	128 deaths.
1871.....	146 births.....	64 marriages.....	116 deaths.
1872.....	171 births.....	76 marriages.....	184 deaths.
1873.....	163 births.....	69 marriages.....	160 deaths.
1874.....	170 births.....	80 marriages.....	151 deaths.
1875.....	156 births.....	76 marriages.....	169 deaths.
1876.....	170 births.....	59 marriages.....	156 deaths.
1877.....	168 births.....	64 marriages.....	160 deaths.
1878.....	172 births.....	80 marriages.....	156 deaths.
<hr/>			
Total.....	2,447 births.....	1,125 marriages.....	2,405 deaths.

There were more births, more marriages and a less number of deaths in 1878 than in 1877; the number of births was 16 more than the number of deaths.

The circumstances favorable to the promotion of the physical health and vigor of the colored race, are believed to be, at least, quite as ample in Rhode Island, as in any other Northern or Eastern State. When we find that in a period of eighteen years, as seen in the synopsis above, the excess of births over the deaths, is only 42, and have full knowledge of the fact, that the State is having accession annually to the number of colored people by immigration, and that accession largely in the periods of life between 20 and 40 years, and of both sexes, we must conclude, however reluctantly, that the race is not self sustaining in this latitude.

There is always a tendency to reduce the number of facts relating to the colored population, by omitting to mark all the colored persons as colored. This source of error is constant, though constant care is taken to prevent it.

## CAUSES OF DEATH, 1878.

The statistics of the causes of death in Rhode Island, in 1878, will be found in Tables VI, VII and VIII. The whole number of deaths, as previously stated, was 4,441. The number of which the cause of death was reported, was 4,231, and the number of which the cause was not stated, was 210. The number from unknown causes was 18 more than in 1877.

The following Table shows the number of deaths in 1878, in each larger division of the State, and the number and percentage in each division, of which the cause was unknown:

TABLE XLII.

1878.	Bristol County.	Kent County.	Newport County, Towns.	Newport City.	Providence County, Towns.	Providence City.	Washington County.	Whole State.
Number of Deaths.....	193	288	76	223	1,411	1,989	261	4,441
Cause not stated.....	6	89	2	32	108	16	12	210
One in.....	32.1	74.0	38.0	7.0	13.7	124.2	21.7	21.1

The returns of deaths, and especially the returns of the *causes* of deaths, are manifestly more incomplete than any other of the vital statistics of the State. That the *cause* of death in one out of every 21 decedents in the State, should be returned as unknown, is positive evidence that there is a defect in the Registration law, as well as proof that there is neglect of duty on the part of those who should observe the law as it stands. The remedy is in the enactment of a law for the State, such as is provided by municipal ordinance in the city of Providence, that is, the requirement of burial permits, and the pre-require-

ment of return of death, and *cause* of death when known. There is no reason why there should not be as many deaths in Providence city from causes unknown, as in other parts of the State, when as will be seen by Table XLII, the proportion for the whole State, including the city, is one in every 21.1, or nearly six times larger, and for the rest of the State, excluding the city, the proportion of deaths from unknown causes is one in 12.6 or about ten to every one returned from the city. A comparison of the returns of causes of death unknown in 1878, with those of 1877, show no improvement in respect to accuracy.

The following Table will present comparisons of one year with another for a considerable period of time.

TABLE XLIII.

*Showing the proportion of Deaths reported, with cause "unknown," in each Division of the State, and in the whole State, in each of the last sixteen years, from 1863 to 1878, inclusive.*

YEARS.	Bristol County.	Kent County.	Newport County.	Providence County, Towns.	Providence City.	Washington County.	Whole State.
1863, One in .....	16.5	11.2	25.5	6.9	46.7	24.7	14.7
1864, One in .....	57.0	12.6	11.6	8.5	45.7	47.6	16.1
1865, One in .....	64.3	27.4	13.4	8.2	55.0	32.9	16.4
1866, One in ... ..	163.0	11.4	22.4	9.5	45.0	28.3	17.3
1867, One in .....	.....	13.6	34.5	7.4	64.0	14.3	14.8
1868, One in .....	33.2	5.0	20.3	5.2	46.2	10.1	10.1
1869, One in .....	41.2	5.8	52.8	5.3	83.6	16.1	11.3
1870, One in .....	.....	19.3	23.6	11.8	90.2	26.9	23.6
1871, One in .....	151.0	81.2	7.9	8.4	83.6	9.8	13.0
1872, One in ... ..	13.3	5.8	10.0	6.8	72.8	9.8	11.3
1873, One in ... ..	.....	16.0	25.4	9.8	102.5	27.5	20.3
1874, One in ... ..	54.0	15.2	14.0	17.2	73.7	21.2	27.8
1875, One in .....	55.0	7.4	15.6	13.7	91.2	11.9	20.9
1876, One in ... ..	11.5	7.9	18.5	9.9	124.3	22.8	19.3
1877, One in ... ..	.....	17.7	9.7	11.9	323.0	16.0	23.2
1878, One in .....	32.1	74.0	9.0	13.7	124.2	21.7	21.1

It will be seen by the above Table, that great disparities in the number of deaths from unknown causes, are reported from year to year, from the different divisions of the State, and in the average of the whole State. For the whole State, the variation has been from one in every 10.1, in 1868, to one in every 27.8, in 1874.

In Bristol county, the variations have been from one in every 11.5, in 1876, to a complete return of the cause of every death in the county, in four of the sixteen years. Bristol county is the only one in the State that has reported the cause of every death in any year.

The variations in Kent county have been very considerable, that is, from one in every 5.0, in 1868, to one in 81.2, in 1871. Newport county, including the city of Newport, has varied from one in 7.9, in 1871, to one in 52.8, in 1869.

The difference between Newport county towns, and Newport city, as shown in Table XLII, is seemingly evidence of neglect somewhere. It is hardly probable that one in every seven deaths in Newport city, was from cause unknown.

In Providence county towns the largest proportion was in 1868, *i. e.*, one in 5.2; the smallest in 1874, *i. e.*, one in 17.2. Providence city shows a variation from one in every 45.0, in 1866, to one in 323.0, in 1877. The small percentage of reported deaths from unknown causes in the city of Providence, is conclusive evidence of the efficiency of a law properly enforced, requiring certificates of cause of death, when known, and permission for burial or removal of the dead.

In Washington county, the proportions have varied from one in 9.8, in 1871 and 1872, to one in every 47.6, in 1864.

#### PRINCIPAL CAUSES OF DEATH.

The following Table gives the number of deaths in Rhode Island, from each of thirteen principal causes, showing the order in regard to number, in each of the last three years, and also in the aggregate of deaths for twenty-three years and seven months, from June 1st, 1852, to December 31st, 1875:

TABLE XLIV.

*Showing the order in regard to number of deaths from thirteen principal causes of death.*

1878.	1877.	1876.	June 1st, 1852, to Dec. 31st, 1875—23 yrs. 7 mos.
Whole Number.... 4,441	Whole Number.... 4,450	Whole Number.... 4,116	Whole Number.... 68,838
Consumption..... 676	Consumption..... 661	Consumption..... 665	Consumption..... 11,301
Diphtheria..... 435	Diphtheria..... 492	Pneumonia and Conges. of Lungs 339	Pneumonia and Conges. of Lungs 3,871
Pneumonia and Conges. of Lungs 317	Cholera Infantum. 259	Cholera Infantum. 250	Old Age..... 3,709
Old Age..... 222	Pneumonia and Conges. of Lungs 226	Old Age..... 241	Cholera Infantum. 3,493
Cholera Infantum. 168	Old Age... 213	Heart, Diseases of. 166	Scarlatina... 3,206
Heart, Diseases of. 166	Heart, Diseases of. 182	Apoplexy and Paralysis... 165	Fevers, Typhoid, &c..... 2,692
Fevers, Typhoid, &c..... 150	Apoplexy and Paralysis..... 181	Diphtheria..... 159	Heart, Diseases of. 2,481
Accidents (all kinds)..... 122	Cancer (all kinds). 135	Fevers, Typhoid, &c..... 126	Apoplexy and Paralysis..... 2,233
Cancer (all kinds). 119	Fevers, Typhoid, &c..... 134	Accidents (all kinds)..... 114	Dysentery..... 1,975
Convulsions and Fits..... 112	Accidents (all kinds)..... 132	Cancer (all kinds). 106	Accidents (all kinds)..... 2,108
Apoplexy and Paralysis..... 102	Croup..... 95	Croup..... 102	Convulsions and Fits..... 1,457
Croup..... 93	Convulsions and Fits..... 83	Convulsions and Fits..... 89	Croup..... 1,396
Scarlatina..... 86	Scarlatina..... 62	Scarlatina..... 80	Hydrocephalus... 1,064

It will be seen by the above Table, that consumption still retains its bad preëminence as a cause of death in Rhode Island, and with an increased number of victims. There were 15 more deaths from consumption in 1878 than in 1877, and 21 more than in 1876. Previous to 1875 the number had never reached 600. With the exception of consumption, no disease or cause of death has invariably held the same place in the order of greatest number, in a series of years.



The various degrees of change of place will be observed in the columns presented above.

For the first time in these Reports, diphtheria took second place, in 1877. It holds the same position, in 1878, but with a lessened number. Pneumonia, which ranks next to consumption in the long period, takes third position in 1878. Old age follows, in 1878, as in the long period. Cholera infantum occupies a lower rank than in 1877, with a reduction of mortality of about 33. per cent. Scarlatina, which ranks fifth in the long series of years, has dropped in each of the three last years to the lowest place.

Fevers, of various forms, diseases of the heart, apoplexy and croup, have changed their respective positions from year to year, but not to any large degree.

The next Table shows the whole number, sex, parentage and ages of the decedents, and the locality and season of deaths in Rhode Island, in 1878, from sixteen of the principal causes of death.

TABLE XLV.  
*Showing the Deaths in Rhode Island, in 1878, from Sixteen Principal Causes.*

	Accidents.	Apoplexy and Paralysis.	Brain, Diseases of.	Cancer.	Cholera Infantum.	Consumption.	Croup.	Diarrhoea.	Diphtheria.	Dysentery.	Fevers, Typhoid, &c.	Heart, Diseases of.	Hooping Cough.	Old Age.	Pneumonia and Congestion of Lungs.	Scarlatina.
Whole Number.....	122	188	139	119	168	676	93	53	435	40	150	166	54	222	317	86
Sex																
{ Males.....	89	104	75	38	96	296	45	28	224	14	68	88	26	84	143	41
{ Females.....	33	84	64	81	72	380	48	25	211	26	82	78	28	138	174	45
Age																
{ American.....	50	145	73	79	73	296	43	26	201	25	77	109	30	172	176	35
{ Foreign.....	72	43	66	40	95	380	50	27	234	15	73	57	24	50	141	51
Month																
{ January.....	17	19	10	10	1	60	13	2	64	1	7	12	4	14	48	6
{ February.....	9	14	14	6	..	42	12	4	30	1	1	13	5	20	46	3
{ March.....	4	25	10	13	2	65	4	1	50	1	8	15	3	22	41	3
{ April.....	8	13	13	6	..	50	9	1	40	2	5	13	3	26	36	3
{ May.....	8	13	17	6	..	74	..	1	27	2	6	12	1	19	20	5
{ June.....	14	15	15	10	6	62	3	1	34	..	10	17	1	11	11	6
{ July.....	14	10	16	10	69	43	3	13	13	7	9	10	8	11	11	14
{ August.....	7	15	3	12	49	65	3	14	25	9	18	11	12	17	10	6
{ September.....	14	11	8	15	25	58	1	3	23	4	27	13	7	22	13	4
{ October.....	7	13	11	9	10	42	11	3	47	6	20	7	4	17	15	16
{ November.....	7	17	8	9	4	53	14	4	48	1	21	21	3	21	26	6
{ December.....	13	18	14	13	2	62	20	6	34	1	18	22	3	22	40	14

TABLE XLV.—Continued.  
*Showing the Deaths in Rhode Island, in 1878, from Sixteen Principal Causes.*

AGES.	Accidents.	Apoplexy and Paralysis.	Diseases of Brain.	Cancer.	Cholera Infantum.	Consumption.	Croup.	Diarrhea.	Diphtheria.	Dysentery.	Typhoid, &c.	Heart, Diseases of.	Whooping Cough.	Old Age.	Pneumonia and Congestion of Lungs.	Scarlatina.
Under 5 years.....	32	...	60	2	168	19	72	31	267	18	5	4	52	...	115	54
5 and under 10....	9	...	9	...	...	8	19	...	124	1	12	2	2	...	9	26
10 " " 15.....	7	...	5	...	...	14	2	...	33	...	16	3	...	...	4	4
15 " " 20.....	4	4	6	1	...	69	...	...	3	...	27	7	...	...	10	1
20 " " 30.....	13	2	3	1	...	214	...	2	1	1	47	8	...	...	14	1
30 " " 40.....	14	7	10	8	...	139	...	3	2	...	13	18	...	...	17	...
40 " " 50.....	14	14	11	15	...	78	...	3	3	2	11	16	...	...	28	...
50 " " 60.....	7	41	12	31	...	56	...	3	1	4	12	26	...	...	20	...
60 " " 70.....	10	40	13	24	...	45	...	3	...	4	2	36	...	4	42	...
70 " " 80.....	9	53	5	14	...	29	...	6	1	9	3	35	...	73	45	...
80 and over.....	4	26	4	5	...	5	...	2	...	1	2	11	...	145	13	...
Not stated.....	1	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Bristol County.....	4	12	1	5	7	23	14	3	21	2	13	5	...	15	30	3
Kent County.....	6	16	12	11	14	41	3	3	29	5	15	11	1	8	11	5
Newport Co., Towns	3	10	2	2	1	10	...	...	3	...	5	6	...	9	3	3
Newport City.....	6	11	9	6	6	21	7	2	20	...	2	9	...	23	15	...
Prov. Co., Towns...	46	58	45	37	64	229	25	17	106	17	62	38	9	76	110	14
Providence City....	52	66	68	48	71	305	39	28	245	11	56	83	43	61	140	57
Washington Co.....	5	15	2	10	5	47	5	...	11	5	14	14	1	30	28	4

## REMARKS.

In the consideration of the causes of death, in 1878, in the following pages, they will be taken up in the alphabetical order in which they appear in the preceding Table.

Other causes of death, however, and from diseases especially, may be commented upon, in connection therewith, or separately, as they may appear to be similar in some respects, or present a high degree of fatality.

## ACCIDENTAL DEATHS.

The number of deaths from accidental causes, of all kinds, reported in Rhode Island, in 1878, was 122. This number is 10 less than in 1877, and 6 more than in 1876.

Of these 122 deaths, 11 were from burns and scalds; 44 by drowning; 13 from falls; 6 from poisoning; 7 from railroad accidents, and 41 from various accidents too numerous to specify.

## APOPLEXY AND PARALYSIS.

There were 188 deaths from apoplexy and paralysis, reported in Rhode Island, in 1878, which were 7 more than in 1877, and 23 more than in 1876.

The following Table will give a synopsis of the several relations of these causes, for the last fourteen years:

TABLE XLVI.

*Showing the whole number and percentage of the Deaths in the State, from Apoplexy and Paralysis combined; and also the sex and parentage of the Decedents from these causes, and the number of the same in each of the Counties from 1865 to 1878, inclusive:*

YEARS.	Whole number of Deaths.	APOPLEXY AND PARALYSIS.											
		Number from Apoplexy and Paralysis.	Per cent.	SEX.		PARENTAGE.		DIVISIONS OF THE STATE.					
				Males.	Females.	American.	Foreign.	Bristol County.	Kent County.	Newport County.	Providence County, Towns.	Providence City.	Washington County.
1865.....	3,405	100	2.93	52	48	81	19	9	8	14	23	38	8
1866.. ..	2,970	92	3.09	46	46	80	12	8	5	17	24	29	9
1867.....	2,889	124	4.29	59	65	101	23	9	9	18	35	49	9
1868.....	2,912	111	3.81	56	55	86	25	9	6	19	27	46	4
1869.....	3,382	117	3.46	55	62	92	25	12	13	18	30	48	6
1870.....	3,298	130	4.32	68	62	105	25	14	10	10	39	52	5
1871.....	3,344	156	4.66	73	83	113	43	10	17	15	40	61	13
1872.....	4,347	125	2.97	62	63	96	29	17	9	10	27	52	10
1873.....	4,408	134	3.04	59	75	109	25	9	8	17	26	57	17
1874.....	4,229	156	3.69	84	72	120	36	14	10	16	42	59	15
1875.....	4,317	166	3.81	79	87	133	33	7	13	17	46	75	8
1876.....	4,116	165	4.01	79	86	130	35	13	11	13	45	68	15
1877.....	4,450	181	4.07	87	94	123	58	10	10	16	52	74	19
1878.....	4,441	188	4.23	104	84	145	43	12	16	21	58	66	15
Total.....	52,343	1,945	3.60	945	962	1,514	431	153	145	216	504	774	153

It will, perhaps, be noticed, that in calculating the percentages of the different causes of death, as found in the several Tables under the heading "Causes of Death," the computations are made on the basis of the whole number of deaths, and not on the number of *named causes* of death. Attention may be called to the fact, however, which will explain what otherwise might be thought to be discrepancies between the percentages of the text, and the percentages of the Tables. The

percentages of the text, calculated for the several divisions of the State, are based, when not otherwise stated, on the proportion to the whole number of specified causes.

The method of computation upon the basis of the whole number of deaths, was begun many years ago, with the beginning of the present forms of tabulation, and a change now would destroy the uniformity of results.

The number of deaths from apoplexy and paralysis, was larger, in 1878, than in any preceding year, and the proportion to the whole number of deaths, 4.23 per cent., has been exceeded in only three of the preceding thirteen years.

The various changes from year to year, in the numbers of the sexes, the parentages, and in the different divisions of the State, as shown in Table XLVI, are of considerable interest. The footing up of each column of sex shows a slightly larger number of females, and a glance at the columns of parentage, will show the great difference between the two classes. While the deaths in both classes, from these causes, have increased in a much greater ratio than the increase of population, the decedents of American parentage have been in much the larger proportion, in comparison with the whole American population. Of the whole number of decedents, 1,945, in the last fourteen years, 1,514 were of American parentage, and 431 of foreign parentage, or 77.8 American, and 22.2 foreign parentage.

The mortality from apoplexy and paralysis, in 1878, in relation to season, was as follows:

First Quarter, 53 ..... Second Quarter, 46 ..... Third Quarter, 36 ..... Fourth Quarter, 48

Percentages:

First Quarter, 30.85 ..... Second Quarter, 24.47 ..... Third Quarter, 19.15 ..... Fourth Quarter, 25.43

TABLE XLVII.

*Showing the ages of Decedents from Apoplexy and Paralysis in each of the last fourteen years :*

APOPLEXY AND PARALYSIS.	PERIODS OF LIFE.								
	Under 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 and over.	Not stated.
1865. ....	...	3	5	6	19	20	28	19	...
1866. ....	1	1	7	16	9	24	27	7	...
1867. ....	2	...	6	6	15	38	40	17	...
1868. ....	2	3	3	11	16	27	31	16	2
1869. ....	1	1	5	12	20	28	34	15	1
1870. ....	4	1	10	9	12	33	41	20	...
1871. ....	3	4	7	14	21	46	45	15	1
1872. ....	1	4	5	17	20	26	41	11	...
1873. ....	2	3	4	14	22	35	37	16	1
1874. ....	1	2	9	9	30	30	40	25	1
1875. ....	6	2	8	19	23	40	45	22	1
1876. ....	4	4	4	13	25	43	49	23	...
1877. ....	1	2	9	12	24	50	61	22	...
1878. ....	4	2	7	14	41	40	53	26	1
Total. ....	32	32	89	172	297	480	571	254	8

Apoplexy is not a disease to be often expected in the earlier periods of life. Paralysis resulting from other causes sometimes occurs, and is occasionally fatal. Hence as the two diseases are taken together in the above Table, there are some recorded cases under 20 years of age. The largest number in every year, with scarcely an exception, is between the ages of 70 and 80. Above the age of 50 years, the number of decedents from apoplexy and paralysis increases rapidly in the ratio of mortality. More than 80 per cent. of all the deaths from these causes, are of persons above 50 years of age.

#### BRAIN, DISEASES OF.

In Table XLV, under the head of "Diseases of the Brain," are included all those reported as "Cerebral Meningitis," "Cerebritis," "Congestion," "Inflammation," and "Diseases of the Brain."

The number of decedents from these several causes, grouped under the head of "Diseases of the Brain," in 1878, was 139, which was 16 less than in 1877, and 5 less than in 1876. The proportion to the whole number of deaths from given causes, was 3.30 per cent. Of the 139 decedents, 75 were males, and 64 were females; 73 were of American parentage, and 66 of foreign parentage.

The deaths in the different seasons of the year were as follows:

First Quarter.....	34	Second Quarter.....	45
Third Quarter .....	27	Fourth Quarter.....	33
Total.....	139		

In relation to the periods of life, 60 of the deaths were of children under 5 years of age, or more than 43.0 per cent. of the whole.

#### CANCER.

The number of deaths reported as having been caused by cancer, in 1878, was 119. This number is 16 less than in 1877; 13 more than in 1876, and is nearly 2.82 per cent. of the whole of the known causes of death in 1878.

As in the preceding topic the several varieties are grouped under one head.

In Tables VI and VII, pages 30 and 35, they are reported as follows: Cancer, various, 75; of the breast, 11; of stomach, 15; of uterus, 18.

Of the whole number of decedents (119) 38 were males and 81 were females; 79 were of American, and 40 were of foreign, parentage.

The large proportional number of females, nearly 70.0 per cent., though not so large as in 1877, when it was 78.52 per cent., is still indicative of the greater liability of the female sex to this dread disease. Cancer of the breast, in females, and cancer of the uterus, constitute nearly 25.0 per cent. of the whole number.

If season has any influence on mortality from cancer, it is from extremes of heat and cold, acting upon an exhausted organism.

In 1878, the deaths from cancer, in the several seasons of the year, were as follows:

First Quarter.....	29	Second Quarter.....	22
Third Quarter.....	37	Fourth Quarter.....	31
Total.....	119		



It will be seen that about 55.0 per cent. of deaths, occurred in the first and third quarters.

Of the whole number of deaths (119) from cancer, in 1878, 4 only were of persons under 30 years of age, and 27 only of persons under 50 years of age, 92 having attained the age of 50 and over.

In relation to locality, the deaths from cancer seem to be nearly evenly distributed in the several divisions of the State, in proportion to the population, the ratio being somewhat less than one to every two thousand of the inhabitants. In Newport county, in 1878, the ratio, however, was only about one in every twenty-seven hundred of the inhabitants.

#### CHILD-BIRTH.

Deaths from child-birth and concomitant diseases, have heretofore been considered in the alphabetical list of causes of death, probably not so much from the number of deaths, as from their relation to other circumstances.

The number reported in 1878, was 43; 15 of which were from the immediate effects of child-birth alone; 11 from puerpural convulsions, and 17 from puerpural fever.

Of the whole number, 23 were of American, and 20 of foreign, parentage.

In the different seasons of the year they occurred as follows:

First Quarter, 13.....Second Quarter, 9.....Third Quarter, 11.....Fourth Quarter, 10

Of the decedents, 4 were under 20 years of age, 18 between 20 and 30, 17 between 30 and 40, and the remaining 4 over 40 years of age.

#### CHOLERA INFANTUM.

The number of deaths reported in 1878, from cholera infantum, was 168, which is 91 less than in 1877, and also less than in any year since 1869. It is 223 less than in 1872, and 150 less than in 1875. The diminution is quite remarkable. The number of deaths from diarrhœa and dysentery, was also much smaller in 1878, than for several previous years.

The percentage of deaths from cholera infantum, in 1878, was 3.97, as against 6.08, in 1877.

Of the 168 decedents, 96 were males and 72 females; 73 were of American, and 95 of foreign, parentage; 122 were under the age of

one year, 34 were between 1 and 2 years of age, and 12 were between 2 and 5.

In regard to season, one death was reported in January, 2 in March, 6 in June, 143, or about 85.0 per cent., in the months of July, August and September, and 16 during the rest of the year.

The distribution of deaths from cholera infantum was very unequal in the different divisions of the State. The number in Bristol county, with a population of 11,019, was 7; in Newport county, with a population of 20,887, it was also 7, so that there were nearly twice as many in proportion to the population, in Bristol county as in Newport county. The proportions have, in almost every year, been largely favorable to Newport county, although in 1876 they were largely in favor of Bristol county. In Newport county, *towns*, deaths from cholera infantum are very infrequent. But one was reported from those towns in each of the years 1877 and 1878, in a population of 7,859, by the Census of 1875. This remarkable exemption cannot be accounted for wholly on the ground of the small number of children under five years of age. Taking a whole county, Washington county shows the smallest percentage, that is, one death from cholera infantum to about each 4,000 of the population. Kent county reports one death to about each 1,850, and Providence county one to each 1,360. Providence city one to each 1,418.

In relation to the whole number of deaths from known causes, in 1878, in the different sections of the State, the proportions in the order of the highest percentage, stand as follows:

	Per cent.		Per cent.
Providence County, Towns.....	4.90	Newport City.....	3.14
Kent County.....	4.42	Bristol County.....	2.70
Providence City.....	3.60	Washington County .....	2.00
Newport County, Towns.....		1.35 per cent.	

The following Table shows the whole number of reported deaths from cholera infantum; the sex and parentage of the decedents, in each of the larger divisions of the State, in each of the last fourteen years:

TABLE XLVIII.

YEARS.	CHOLERA INFANTUM.										
	Number of Deaths.	SEX.		PARENTAGE.		DIVISIONS OF THE STATE.					
		Males.	Females.	American.	Foreign.	Bristol County.	Kent County.	Newport County.	Providence County, Towns.	Providence City.	Washington County.
1865.....	145	63	82	61	84	17	7	14	48	50	9
1866.....	110	67	43	50	60	1	7	8	39	47	8
1867.....	117	64	53	62	55	4	8	7	45	49	9
1868.....	154	85	69	66	88	13	4	12	44	70	11
1869.....	151	81	70	79	72	6	15	6	48	65	11
1870.....	218	106	107	95	118	15	15	13	69	98	8
1871.....	172	85	87	82	90	14	12	12	59	62	13
1872.....	391	195	196	167	224	16	16	21	157	151	30
1873.....	285	148	137	165	120	17	14	16	120	99	19
1874.....	265	140	125	115	150	4	12	5	84	134	26
1875.....	318	156	162	155	163	20	16	20	108	136	18
1876.....	280	131	119	105	145	5	12	29	68	124	12
1877.....	259	139	120	96	163	12	13	9	96	122	7
1878.....	168	96	72	73	95	7	14	7	64	71	5
Total, 14 years.....	2,998	1,556	1,442	1,371	1,627	151	160	179	1,049	1,273	186

It will be seen by the above Table, that there have been 2,998 deaths from cholera infantum, reported in Rhode Island, during the last fourteen years, of which 1,556 were males, and 1,442 were females; or 108 males to each 100 females; or 51.90 males and 48.10 females in each 100.

Of the whole number of decedents, 1,371 were of American, and 1,627 of foreign, parentage; or 45.73 per cent. of American, and 54.27 per cent. of foreign; or 118.7 foreign to each 100 of American parentage.

It will be noticed that in Bristol county, and Providence city, there was a falling off from 1877 of nearly 60.0 per cent.

## CONSUMPTION.

The number of deaths from consumption, reported in Rhode Island, in 1878, was 676; 15 more than in 1877, and 21 more than in 1876. The number is the largest ever reported in the State, but the proportion to the whole number of deaths from known causes, 15.98 per cent., is smaller than the average of the last 19 years, which is 16.96 per cent.

Of the 676 decedents from consumption, the sex and parentage were as follows: In regard to sex, 296 were males, and 380 were females; the proportion standing 43.80 males, and 56.20 females, in each 100; or 128.71 females to each 100 males.

In regard to parentage, 296 were of American, and 380 of foreign, parentage; the proportions, 43.80 American, and 56.20 foreign, in each 100; or 128.71 foreign to each 100 of American parentage.

In regard to season, the largest number of deaths occurred in the second quarterly division of the year, and the smallest number in the fourth, as will be seen by the following summary:

First Quarter, 167.....Second Quarter, 186.....Third Quarter, 166.....Fourth Quarter, 157

The largest number in any one month, was 74 in May; the next largest, 65, in each of the months March and August. In a series of years, the month of May stands first in the order of greatest mortality from consumption.

The smallest number in any month, in 1878, was 42, in each of the months February and October.

No age is exempt from this great destroyer of life. Childhood has no immunity, old age is not spared. Its greatest ravages, however, are in the period of life between 20 and 40 years of age. Of the 676 decedents in 1878, 214, or about 32.0 per cent., were between the ages of 20 and 30, and 139, or about 21.0 per cent., were between 30 and 40. Thus we find about 53.0 per cent., or more than one-half of all the mortality from consumption, is of persons in these two decennial periods of life.

In order to show more concisely the relation of age to mortality, the following synopsis is presented:

Ages.	No. of Deaths.
Under 10 years of age.....	27
Between 10 and 20 years.....	83
Between 20 and 30 years.....	214
Between 30 and 40 years.....	139
Between 40 and 50 years.....	78
Between 50 and 70 years.....	101
Over 70 years.....	34
<hr/>	
Total.....	676

In regard to the distribution of mortality from consumption, in 1878, in the different sections of the State, the same remark may be made as in the case of other diseases, that no reliable data can be obtained from the reports of a single year. In the case of consumption, however, the returns are more uniform than in most other maladies. The largest proportion to known causes of all deaths in same section, was 18.88 per cent., reported from Washington county; the smallest proportion, 11.69 per cent., from Newport county. For the whole State the ratio is 15.98 per cent.

The subject of proportions, in their different relations, will be further considered in comments on the next Table.

The following Table shows the total deaths from all reported *known causes*, with the number and percentage of deaths from consumption, in each of the larger divisions of the State, and in the whole State, in each of the last nineteen years, and in the aggregate for the whole period, from 1860 to 1878, inclusive:

TABLE XLIX.—CONSUMPTION.—*Number and Percentage of Known Causes.*

COUNTIES.	1860.	1861.	1862.	1863.	1864.	1865.	1866.	1867.	1868.	1869.	1870.	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	Total 19 yrs.
<b>BRISTOL COUNTY.</b>																				
Total Deaths.....	146	161	119	109	168	190	162	144	129	165	146	150	184	178	159	162	148	201	187	3,008
Consumption.....	23	25	17	17	20	20	31	18	21	26	26	16	23	16	18	21	19	27	23	407
Percentage.....	15.75	15.53	14.29	15.59	11.90	10.52	19.13	12.50	16.28	15.76	17.81	10.67	12.50	9.24	11.32	12.97	12.88	13.43	12.30	13.42
<b>KENT COUNTY.</b>																				
Total Deaths.....	202	272	235	205	255	238	198	214	168	265	238	281	248	241	252	263	209	251	249	4,484
Consumption.....	41	52	51	46	46	41	41	56	38	50	46	63	33	42	32	43	28	42	41	882
Percentage.....	20.29	19.12	21.70	22.43	18.04	17.22	20.70	26.17	22.62	18.86	19.33	22.42	13.30	17.43	12.69	16.85	13.39	16.73	16.47	18.55
<b>NEWPORT COUNTY.</b>																				
Total Deaths.....	279	344	274	491	372	336	342	302	289	259	271	214	262	366	221	277	280	243	265	5,687
Consumption.....	50	74	41	57	48	51	52	47	43	40	37	23	29	44	26	41	45	33	31	812
Percentage.....	17.92	21.51	14.97	11.60	12.90	15.15	15.18	15.56	14.88	15.44	13.66	10.75	11.06	12.02	11.77	14.80	16.07	13.58	11.69	14.28
<b>PROV. CO., TOWNS.</b>																				
Total Deaths.....	690	688	702	807	870	990	883	902	779	912	964	989	1,331	1,389	1,217	1,230	1,110	1,391	1,308	19,153
Consumption.....	138	148	174	162	146	190	171	210	158	180	172	195	221	197	139	201	211	222	229	3,404
Percentage.....	20.00	21.51	24.78	20.07	16.78	19.19	19.19	23.28	20.29	19.74	17.84	19.72	16.73	14.18	11.42	16.84	19.01	15.96	17.51	18.09

TABLE XLIX.—CONSUMPTION.—Number and Percentage of Known Causes.—Continued.

COUNTIES.	1860.	1861.	1862.	1863.	1864.	1865.	1866.	1867.	1868.	1869.	1870.	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	Total 19 yrs.
PROVIDENCE CITY.																				
Total Deaths.....	958	1,013	884	1,188	1,253	1,189	1,013	945	1,086	1,240	1,249	1,239	1,581	1,725	1,965	1,894	1,850	1,932	1,973	26,177
Consumption.....	217	184	191	208	197	191	200	189	214	210	238	195	242	280	270	297	284	294	305	4,356
Percentage.....	22.65	18.16	21.60	17.50	15.72	16.06	19.74	20.00	19.71	16.95	19.06	15.74	15.31	13.33	13.74	15.68	15.35	15.22	15.46	16.64
WASHINGTON COUNTY.																				
Total Deaths.....	223	247	189	190	233	255	201	187	173	241	233	222	265	292	263	284	306	240	249	4,493
Consumption.....	34	40	36	20	41	54	28	39	38	43	56	35	49	51	44	47	68	43	47	813
Percentage.....	15.24	16.20	19.05	10.52	17.51	21.16	13.93	20.86	21.96	17.84	24.04	15.76	18.49	17.47	16.73	16.55	22.22	17.91	18.88	18.09
WHOLE STATE.																				
Total Deaths.....	2,498	2,725	2,403	2,990	3,151	3,198	2,799	2,604	2,624	3,082	3,101	3,095	3,871	4,186	4,077	4,110	3,903	4,258	4,231	62,996
Consumption.....	503	523	510	510	498	547	523	559	512	549	575	527	597	580	520	650	655	661	676	10,684
Percentage.....	20.14	19.19	21.22	17.05	15.81	16.95	18.68	20.74	19.51	17.81	18.52	17.03	15.41	13.86	12.90	15.79	16.78	15.52	15.98	16.96

An examination of Table XLIX, will well repay the time and attention of the reader, by the interesting facts which it discloses.

It presents the only method of studying with advantage and conclusiveness, the characteristics of consumption in relation to locality, and to proportion to all known causes of death in each of the several counties, and in the whole State, in each year, and in the average of a long series of years.

It is only by the averages of a long series of years, that reliable data and definite conclusions can be established.

By the above Table, comparisons can be made in a variety of ways, which will be suggested to the reader.

In Bristol county, we see that the percentages have varied from 9.24 in 1873, to 17.81 in 1870, the percentage of 1878 being 12.30, and the mean average of nineteen years, 13.42, showing the largest exemption from this disease of any section of the State.

In Kent county, the extremes of variation were 12.69 per cent. in 1874, and 26.17 per cent. in 1867. The last is the largest percentage on record in any part of the State, and is quite remarkable. The percentage of 1878 is 16.47, and for the long period the average is 18.55.

Newport county, like Bristol, shows a noticeable comparative freedom from consumption, in proportion to whole number of deaths from all known causes.

The extremes are 10.75 per cent. in 1871, and 21.51 in 1861. It will be seen, also, that the percentages from year to year, have been slightly less uniform than in Bristol county. In 1878, the percentage was 11.69, and the mean average for the long period 14.28.

Providence county, towns, show a variation from 11.42 per cent. in 1874, to 24.78 in 1862. The percentage of 1878, was 17.51, and for the long period 18.09.

Providence city shows a smaller percentage than the county towns. The extremes were 13.33 per cent. in 1873, and 22.65 per cent. in 1860. In 1878, 15.46, and the long period average 16.64 per cent.

In Washington county, the variations were from 10.52 per cent. in 1863, to 24.04 in 1870. In 1878, 18.88 per cent., and average of the long series of years 18.09.

It will be noticed that Providence county towns, and Washington county, have the same mean average for nineteen years.

In the whole State, the difference of percentage in the different years, was from 12.96 in 1874, to 21.22 in 1862. For 1878, the percentage was 15.98, and for the long period 16.96.



It will be understood that the increased or lessened percentages, in the different years, as presented in Table LIII, do not show the actual difference in the number of deaths from consumption, but the proportion to the *total deaths* from all *known* causes. For instance, there were 510 deaths from consumption in the whole State, in each of the years 1862 and 1863, but the percentages were 21.22 and 17.05, respectively. The smaller percentage of 1863 was owing to the occurrence of nearly 600 more deaths in 1863, from all diseases, than occurred in 1862. While the real number of deaths from consumption does not vary greatly one year with another, the occurrence in any year of a sweeping epidemic, or any disease in unusual numbers, attended with large fatality, would greatly reduce the percentage of mortality from consumption for that year. But taking the average percentage of a long period of years, equalizes the irregularities of single years, and affords a basis for definite conclusions.

It may be of interest to compare the whole number of deaths from consumption, in the last nineteen years, in the different divisions of the State, with the number of inhabitants of the same divisions, for the purpose of ascertaining the percentage of deaths from that cause in proportion to the population. If the population of all sections increased with equal ratio, such comparison would show the relative liability of the inhabitants of each section to the disease, with quite full accuracy. But as it is, an average of the semi-decennial enumerations may be taken, which will afford such an approximation to exactness, as to make the comparisons sufficiently correct.

It will be remembered, however, that the annexation of outlying territory to the city of Providence, during the period taken, will make a slight difference between the computed and the real percentages of Providence county and the city, and *only* a slight difference.

For the purpose indicated, the following summary has been prepared with considerable labor. The computations for 1878, are on the basis of the population by the Census of 1875.

#### CONSUMPTION—PROPORTION OF DEATHS TO POPULATION.

1878.

	Total Deaths.	To population one in every	
Bristol County.....	23.....	482.....	or 2.06 in each 1,000
Kent County.....	41.....	496.....	or 2.02 in each 1,000
Newport County.....	31.....	706.....	or 1.41 in each 1,000
Providence County, Towns.....	229.....	370.....	or 2.72 in each 1,000
Providence City.....	305.....	330.....	or 3.08 in each 1,000
Washington County.....	47.....	427.....	or 2.34 in each 1,000

1860-1878.

## NINETEEN YEARS, INCLUSIVE.

	Yearly average to population one in every	Yearly Average. No. of deaths.	
Bristol County.....	442.....	21.4.....	or 2.26 in each 1,000
Kent County.....	403.....	43.8.....	or 2.48 in each 1,000
Newport County.....	492.....	42.7.....	or 2.08 in each 1,000
Providence County, Towns.....	408.....	182.3.....	or 2.48 in each 1,000
Providence City.....	849.....	229.0.....	or 2.87 in each 1,000
Washington County.....	452.....	42.0.....	or 2.21 in each 1,000

The variations between single years, and the average of a series of years, are very clearly shown in the above Tables. It will be seen that in all the divisions, except Providence city, Providence county towns, and Washington county, the percentages of 1878 were smaller than the averages of the long period. But the number of deaths in each, was but slightly diminished, if at all, and in Providence city there was the largest number ever recorded. The proportion of deaths from consumption to the whole population in the city, was, however, much smaller in 1878, than in some other previous years. In 1863, there was one death from that cause in every 244 of the population of the city, or 4.09 in each 1,000; and in 1870, the proportion was one in every 289.5, or 3.45 in each 1,000.

It will be noticed that the liability to consumption in the several divisions of the State, has prevailed in the order of largest percentage as follows, viz.: Providence city; Providence county towns, and Kent county, alike; Bristol county; Washington county, and lastly, and in liability much the least, Newport county.

## CROUP AND DIPHTHERIA.

These two diseases, similar in many respects, have been considered together in these reports since 1858. The contrast is made for the purpose of showing their various relations, the same as with other diseases, and not from any suspicion of identity, croup being primarily, by general belief, a local disease, and diphtheria a constitutional disease.

The following Table shows the number of deaths and the sex of the decedents in Rhode Island, from croup and from diphtheria, in each of the seven years, from 1858 to 1864, inclusive:

TABLE L.

YEARS.	CROUP.			DIPHTHERIA.		
	Males.	Females.	Total.	Males.	Females.	Total.
1858.....	35	34	69	1	5	6
1859.....	37	31	58	10	10	20
1860.....	27	30	57	24	43	67
1861.....	32	26	58	66	74	140
1862.....	34	39	73	31	50	81
1863.....	51	46	97	73	89	155
1864.....	48	57	105	67	93	160
Seven Years.....	264	253	517	272	357	629

There were no returns of death from diphtheria previous to the year 1858. In that year there were six deaths reported from that cause. From that time the disease rapidly rose to a prominent place in the list of causes of death. It will be noticed that the above Table gives only the *number* and *sex* of decedents from diphtheria and croup, for seven years previous to 1865.

The following Table gives the number, the sex and the *parentage*, of the decedents from croup and from diphtheria, in Rhode Island, in each of the last fourteen years, from 1865 to 1878, inclusive:

TABLE LI.

YEARS.	CROUP.					DIPHTHERIA.				
	Number of Deaths.	SEX.		PARENTAGE.		Number of Deaths.	SEX.		PARENTAGE.	
		Males.	Females.	American.	Foreign.		Males.	Females.	American.	Foreign.
1865.....	94	44	50	82	62	83	41	41	62	20
1866.....	53	26	27	22	31	64	26	38	36	28
1867.....	50	25	25	21	29	31	14	17	19	12
1868.....	30	13	17	14	16	20	8	12	11	9
1869.....	41	19	22	14	27	33	18	15	19	14
1870.....	53	29	24	25	28	33	17	16	18	15
1871.....	72	39	33	31	41	57	23	34	29	28
1872.....	66	37	29	17	49	48	24	24	35	13
1873.....	68	30	38	35	33	45	24	21	35	10
1874.....	65	39	26	38	27	59	30	29	37	22
1875.....	96	53	43	43	53	33	17	16	18	15
1876.....	102	50	52	42	60	159	77	82	69	90
1877.....	95	48	47	34	61	492	239	253	233	259
1878.....	93	45	48	43	50	435	224	211	201	234
Totals, 14 years.....	978	497	481	411	567	1,591	782	809	823	769

During the eighteen years previous to the beginning of the year 1876, there had been reported in Rhode Island 1,205 deaths from croup, and 1,134 deaths from diphtheria. Croup had constantly, in every year, a larger mortality than diphtheria. By the above Table, we can see how marked the change during the subsequent three years. While the mortality from croup was increased nearly 0.50 per cent. annually above the average of the preceding eighteen years, that of diphtheria was increased by an average of about 575.0 per cent. annually, or within 48 of as many deaths in three years, as in the previous eighteen years, and bounding in the second year, to the second place in the list of causes of death, in the order of the greatest number. At the end of the year 1878, the whole number of deaths from croup, for the previous twenty-one years, was 1,495, and of diphtheria 2,220, a difference of 725 in the greater mortality from diphtheria.

## SEX AND PARENTAGE.

It will be noticed that the difference in the number of the sex of the decedents from croup has been less in each of the last three years, than in the largest number of previous years, and that in diphtheria the inequality of the sexes has been less during the last fourteen years than during the earlier period of its existence in the State.

For the whole period of twenty-one years, the percentage of mortality from croup, in the sexes was, in each 100, 50.90 males, and 49.10 females.

In diphtheria the percentage of mortality for the same period, in the different sexes, was 47.48 males, and 52.52 females, in each 100 decedents.

The following summary will show in a more concise form the percentage of deaths in the sexes from croup and diphtheria, and also the parentage of the same decedents in the last fourteen years.

## IN EACH 100 DECEDENTS,

1865-1878.

	Males.	Females.	Total.	American Parentage.	Foreign Parentage.	Total.
Croup.....	50.82	49.18	100.00	42.02	57.98	100.00
Diphtheria.....	49.15	50.85	100.00	51.66	48.34	100.00

In regard to the parentage of the decedents, it will be seen, that although the foreign population in the State is considerably less than the American, the decedents from croup are in large excess of foreign parentage, and the decedents from diphtheria are in excess of American parentage.

When we consider the numerical relations of the two classes of population, it will however be found, that there is a slight excess of *percentage* of mortality from diphtheria of foreign parentage.

## SEASON AND MORTALITY.

The influence of season in regard to mortality from croup and diphtheria, may be seen in the following Table, where they may also be compared with scarlatina, to which they bear resemblance in some respects. The Table will give the whole number of deaths in the periods named, and the average monthly and quarterly percentages of deaths, from each disease:

TABLE LII.

MONTHS.	CROUP. 1853-1878.		DIPHTHERIA. 1858-1878.		SCARLATINA. 1853-1878.	
	Number of Deaths.	Per cent.	Number of Deaths.	Per cent.	Number of Deaths.	Per cent.
January.....	213	12.21	201	9.05	401	11.65
February.....	186	10.66	143	6.45	383	11.13
March.....	145	8.31	163	7.34	355	10.31
First Quarter.....	544	31.18	507	22.84	1,139	33.09
April.....	123	7.05	168	7.56	292	8.48
May.....	89	5.11	140	6.31	317	9.21
June.....	83	4.75	134	6.04	310	9.01
Second Quarter.....	295	16.91	442	19.91	919	26.70
July.....	57	3.26	106	4.77	208	6.02
August.....	53	3.04	129	5.81	159	4.64
September.....	112	6.42	195	8.79	156	4.53
Third Quarter.....	222	12.72	430	19.37	523	15.19
October.....	186	10.66	284	12.79	211	6.13
November.....	232	13.29	291	13.11	272	7.91
December.....	266	15.24	266	11.96	378	10.96
Fourth Quarter.....	684	39.19	841	37.88	861	25.02
Totals. ....	1,745	100.00	2,220	100.00	3,442	100.00

It will be observed that the above statistics of croup and scarlet fever are for the whole period of twenty-six years, from 1853 to 1878, inclusive, while those of diphtheria are only for the period of twenty-one years, from 1858 to 1878, inclusive, the year 1858 being the first in which deaths from diphtheria were reported.

It will be interesting to study the above Table, in relation to the season of greatest mortality, in each of the diseases placed in comparison.

For instance, in the case of croup, we see that the average percentage of a period of twenty-six years, regularly diminishes from the beginning of the year, until August, in which month we find the minimum percentage, and then as regularly increases through the remainder of the year, the highest percentage being found in December.

In scarlatina, the percentages diminish in an almost equally uniform manner until September, in which the lowest percentage is found, and the only break in the regularity of diminution during the nine months, occurring in April. The percentages, then, with entire regularity, increase each month until January, in which is found the maximum.

In diphtheria, for the period of twenty-one years, the percentages diminish, though somewhat irregularly, from and including December, through the first half of the year, and reaching the minimum in July; then increasing quite regularly until November, in which month is found the highest percentage.

It will be noticed that diphtheria anticipates both croup and scarlatina, in the time of reaching the lowest percentage, by one month in the case of croup, and by two months in the case of scarlatina.

But aside from the similarity of the three diseases, in the diminution of mortality and of prevalence also, as the months of the warmer season advance, there are decided differences in the relative percentages of the several quarterly divisions of the year.

The following summary will present very concisely the differences in the percentages of mortality, from the different diseases, in each of the quarterly periods, as above computed, and by other modes of comparison. It will be kept in mind that the percentages of diphtheria are for a period of five years less than either of the others, but it is hardly probable that a more extended period would materially change the results, as to its own percentage of mortality in the different seasons:

Percentages.	First Quarter.	Second Quarter.	Third Quarter.	Fourth Quarter.	First 4 mos.	Second 4 mos.	Third 4 mos.	First 6 mos.	Second 6 mos.
Croup.....	31.18	16.91	12.72	39.19	28.22	16.16	45.62	48.08	51.92
Diphtheria.....	22.84	19.91	19.37	37.88	30.40	22.94	46.66	42.75	57.25
Scarlatina.....	33.09	26.70	15.19	25.02	41.28	29.17	29.55	59.79	40.21

These contrasts show very decidedly the variations of the three diseases, in the ratio of mortality, in the different seasons of the year. It will be noticed that in croup and diphtheria, the largest mortality

is in the last third and last half of the year, and in scarlatina the reverse is the rule, the greater number of deaths occurring in the first third and first half of the year, or more than 0.41 per cent. in the first third, and nearly 0.60 per cent. in the first half of the year.

Diphtheria prevailed much more largely than ever before known, as an epidemic, in Providence city, and in some of the towns in Providence county and Kent county, in the years 1877 and 1878. It was also more or less prevalent, during the same time, in all parts of the State.

It may be of interest to contrast the number and percentage of mortality, from diphtheria, in the different divisions of the State, for the years 1877 and 1878.

## DIPHTHERIA.

1877-1878.

	Deaths from <i>known causes.</i>		Deaths from Diphtheria.		Per cent.	
	1877.	1878.	1877.	1878.	1877.	1878.
Bristol County.....	301	187	12	21	5.97	11.23
Kent County.....	251	249	44	29	17.53	11.64
Towns, Newport County.....	75	74	—	3	—	4.05
Newport City.....	168	191	2	20	1.19	10.47
Towns, Providence County.....	1,391	1,308	122	106	8.77	8.11
Providence City.....	1,932	1,973	295	345	15.27	12.42
Washington County.....	240	249	17	11	7.08	4.42
Whole State.....	4,268	4,231	492	435	11.56	10.28

It will be seen that in Newport city and county towns, and in Bristol county, diphtheria prevailed more largely, or at least the mortality was greater, in 1878, than in 1877. In all the other divisions the mortality was less. In the whole State, the mortality was about one and one-quarter per cent. less in 1878 than in 1877.

The following Table will show the statistics of scarlatina for each of the last twenty-four years, from 1855 to 1878, inclusive, the whole number of deaths in the State, the number, and percentage and sex of the decedents from scarlatina, and the number from scarlatina in each division of the State. It also shows, from 1865 to 1878, inclusive, the parentage of the decedents from scarlatina:



TABLE LIII.

YEARS.	Whole Number of Deaths.	SCARLATINA.											
		Scarlatina.	Per cent.	SEX.		PARENTAGE.		DIVISIONS OF THE STATE.					
				Males.	Females.	American.	Foreign.	Bristol County.	Kent County.	Newport County.	Providence County, Towns.	Providence City.	Washington County.
1855... ..	1,846	71	3.8	41	30	.....	.....	22	.....	1	6	42	.....
1856.....	2,042	208	10.2	109	90	.....	.....	3	1	3	57	144	.....
1857.....	2,325	147	6.3	69	78	.....	.....	.....	20	47	47	32	1
1858.....	2,616	234	8.9	118	116	.....	.....	5	11	75	61	72	10
1859.....	2,270	71	3.1	34	37	.....	.....	5	2	4	14	45	1
1860.....	2,686	64	2.4	31	33	.....	.....	4	3	7	17	17	16
1861.....	2,927	57	1.9	24	33	.....	.....	2	2	7	9	28	9
1862.....	2,591	47	1.8	25	22	.....	.....	3	4	3	19	14	4
1863.....	3,207	91	2.8	40	51	.....	.....	1	.....	23	24	33	10
1864.....	3,360	266	8.0	120	146	.....	.....	1	19	19	80	141	6
1865.....	3,405	255	7.5	130	125	134	121	33	17	3	86	108	8
1866.....	2,970	28	0.9	15	13	12	16	5	.....	8	12	3	.....
1867.....	2,889	14	0.5	6	8	10	4	1	.....	1	2	10	.....
1868.....	2,912	93	3.2	47	46	32	61	2	3	3	34	50	1
1869.....	3,382	286	8.4	126	160	128	158	17	23	12	72	188	24
1870.....	3,238	75	2.3	37	38	28	47	1	6	3	22	35	8
1871.....	3,344	66	1.9	41	25	31	35	1	3	1	37	21	13
1872.....	4,247	53	1.2	22	31	22	31	.....	1	4	27	19	2
1873.....	4,403	287	6.5	124	163	163	124	4	2	42	80	132	27
1874.....	4,229	462	10.9	231	231	176	286	27	17	1	133	268	16
1875.....	4,317	185	4.3	85	100	121	64	8	30	3	35	94	15
1876.....	4,116	80	1.9	34	46	42	38	3	2	7	21	36	12
1877.....	4,450	62	1.4	26	36	29	33	14	4	3	21	12	8
1878.....	4,441	86	1.9	41	45	35	51	3	5	3	14	57	4
Totals, 24 years..	78,213	3,288	4.2	1,576	1,712	963	1,069	165	175	283	920	1,550	196

## DISEASES OF THE HEART.

The number of deaths reported in Rhode Island, in 1878, from diseases of the heart, was 166. This is the same number reported in 1876, and 16 less than in 1877. The percentage of diseases of the heart in relation to the whole number of deaths is 3.73, and to the whole number of given causes 3.92.

The following Table shows, for each of the fourteen years, 1865 to 1878, inclusive, the whole number of deaths in the State, the number and percentage from diseases of the heart, the sex and parentage of the decedents from diseases of the heart, and the number in each division of the State:

TABLE LIV.

YEARS.	Whole number of Deaths.	DISEASES OF THE HEART.											
		Diseases of the Heart.	Per cent.	SEX.		PARENTAGE.		DIVISIONS OF THE STATE.					
				Males.	Females.	American.	Foreign.	Bristol County.	Kent County.	Newport County.	Providence County, Towns.	Providence City.	Washington County.
1865.....	3,405	98 2.88	51	47	65	33	6	5	8	27	47	5	
1866.....	2,970	115 3.87	58	57	90	25	7	8	10	41	40	9	
1867.....	2,880	114 3.94	67	47	81	33	4	9	7	37	49	8	
1868.....	2,912	116 3.96	58	58	79	37	5	8	12	35	52	4	
1869.....	3,882	128 3.78	75	53	79	49	2	13	11	96	62	4	
1870.....	3,238	117 3.61	77	40	77	40	4	10	8	35	59	1	
1871.....	3,344	144 4.30	78	66	91	53	4	7	8	42	77	6	
1872.....	4,247	189 4.45	104	85	119	70	5	9	10	59	93	13	
1873.....	4,403	189 4.29	83	106	122	67	4	11	14	48	101	11	
1874.....	4,229	214 5.06	109	105	150	64	6	6	28	50	106	18	
1875.....	4,317	186 4.31	84	102	113	73	2	13	22	49	88	12	
1876.....	4,116	166 4.03	86	80	109	57	9	11	10	38	86	12	
1877.....	4,450	182 4.09	94	88	110	72	3	7	9	57	93	13	
1878.....	4,441	166 3.73	88	78	109	57	5	11	15	38	88	14	
Total.....	52,343	2,124 3.91	1,112	1,012	1,394	730	66	128	162	562	1,096	130	

The statistics of diseases of the heart in relation to sex and parentage, present some interesting facts, not anticipated by the average individual. Of the 2,124 decedents from this cause, in the last fourteen years, 1,112 were males, and 1,012 were females; or 52.36 males, and 47.64 females in each 100; or 109.8 males to each 100 females.

The greatest and most unexpected difference in relation to diseases of the heart, is found in parentage. Of the whole number of decedents stated, 1,394 were of American, and 730 were of foreign, parentage; or 65.63 per cent. of American, and 34.37 per cent. of foreign parentage, in each 100 decedents. The proportion of about 191 of American to each 100 of foreign parentage, in the decedents from this cause, is quite worthy of note.

The following Table shows the number of decedents from diseases of the heart, in each divisional period of life, in each of the last fourteen years:

TABLE LV.

YEARS.	Under 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 and over.	Not stated.
1865. ....	14	4	6	7	22	17	19	9	....
1866. ....	18	8	14	17	10	23	21	4	....
1867. ....	11	11	10	13	22	16	27	4	....
1868. ....	15	5	13	11	14	28	25	5	....
1869. ....	21	4	14	18	20	22	21	7	1
1870. ....	19	6	11	13	20	21	23	3	1
1871. ....	9	12	10	19	23	36	28	6	1
1872. ....	27	12	22	19	31	36	29	13	....
1873. ....	19	11	28	18	25	35	42	9	2
1874. ....	20	16	26	21	27	50	40	12	2
1875. ....	14	16	25	20	32	29	41	9	....
1876. ....	14	10	15	19	20	38	39	10	1
1877. ....	15	11	20	18	27	45	33	13	....
1878. ....	16	8	18	16	26	36	35	11	....
Total, 14 years. ....	232	134	232	229	319	432	423	115	8

## PNEUMONIA AND CONGESTION OF THE LUNGS.

The following Table shows, for each of the last fourteen years, the whole number of deaths reported in Rhode Island, the number and

the percentage, with the sex and the parentage of the decedents from pneumonia and congestion of the lungs, and the number in each year, in each division of the State:

TABLE LVI.

YEARS.	Whole Number of Deaths.	PNEUMONIA AND CONGESTION OF THE LUNGS.											
		Pneumonia, &c.	Per cent.	SEX.		PARENTAGE.		DIVISIONS OF THE STATE.					
				Males.	Females.	American.	Foreign.	Bristol County.	Kent County.	Newport County.	Providence County, Towns.	Providence City.	Washington County.
1865.....	3,406	175	5.1	80	95	110	65	8	11	21	49	74	12
1866.....	2,970	198	6.5	94	99	127	66	13	17	13	59	81	10
1867.....	2,889	172	5.9	68	104	103	69	8	12	12	56	68	16
1868.....	2,912	191	6.6	99	92	120	71	9	5	16	54	92	15
1869.....	3,382	190	5.6	104	86	110	80	7	10	10	63	88	12
1870.....	3,238	182	5.6	102	80	96	86	6	12	15	55	78	16
1871.....	3,344	218	6.5	104	114	129	89	12	21	11	68	85	21
1872.....	4,247	229	5.4	119	110	125	104	11	1	9	74	120	14
1873.....	4,403	234	5.3	127	107	143	91	11	9	10	65	123	16
1874.....	4,229	250	5.9	118	132	143	107	6	13	7	73	136	15
1875.....	4,317	400	9.3	199	201	243	157	14	27	25	106	198	31
1876.....	4,116	339	8.2	164	175	162	177	13	23	16	97	163	27
1877.....	4,450	226	5.1	104	122	127	99	10	7	14	81	98	16
1878.....	4,441	317	7.1	143	174	176	141	10	11	18	110	140	28
Total.....	52,343	3,316	6.3	1,625	1,691	1,914	1,402	138	179	197	1,009	1,544	249

The whole number of deaths from pneumonia and congestion of the lungs, reported in Rhode Island, in 1878, was 317, an increase of 91 above that of 1877, and less by 2 than that of 1876. The average of the last fourteen years, is 237. The number in 1877, *i. e.*, 226, as will be seen, was less than the average for the long period, and that too, as against the increase of population. The percentage of mortality from these causes in 1878, was 7.10, or four-fifths of one per cent. above the average 6.30, of fourteen years.

The preponderance of females, among the decedents from inflammation of the lungs in 1878, is quite unusual. The proportion is

121.7 females to each 100 males, and nearly reaches the average excess of female decedents in consumption. For the period of fourteen years, the average proportion is 104 females to each 100 males; or 51 females and 49 males in each 100 decedents from pneumonia and congestion of the lungs. The liability to attacks of acute diseases of the lungs, seems to be nearly equally divided between the sexes, the difference being in favor of the male sex, which, from the presumed greater exposure to the usual exciting causes, would be expected to suffer the most. It is possible, however, that the better physical stamina of the male sex, may result in a larger proportional number of recoveries.

In regard to parentage, the proportion of the decedents is quite unequal. Of the 3,316, whose deaths were reported during the last fourteen years, 1,914 were of American, and 1,402 were of foreign parentage; or 57.72 of American, and 42.28 of foreign, in each 100 decedents; or 136.52 of American to each 100 of foreign parentage.

The following Table shows, for each of the last fourteen years, the number of decedents in Rhode Island, from pneumonia and congestion of the lungs, in each division of ages:

TABLE LVII.

YEARS.	Under 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 and over.	Not stated.
1865.....	65	4	2	14	11	15	17	21	21	5	.....	
1866.....	57	4	4	5	12	10	14	21	25	32	9	.....
1867.....	57	9	2	3	10	11	13	16	25	13	12	1
1868.....	70	4	3	3	15	8	16	13	19	27	13	.....
1869.....	64	11	1	2	11	12	9	28	25	16	11	.....
1870.....	84	6	5	4	6	7	8	14	20	19	8	1
1871.....	71	7	2	7	10	17	16	16	35	17	19	1
1872.....	83	5	1	7	17	20	19	22	24	19	11	1
1873.....	105	4	8	3	10	14	16	17	24	23	10	.....
1874.....	76	9	4	6	17	17	25	21	40	27	8	.....
1875.....	120	9	3	8	22	30	35	39	61	43	28	2
1876.....	116	5	4	3	20	20	32	35	48	39	17	.....
1877.....	79	2	.....	7	15	15	24	27	22	24	9	2
1878.....	115	9	4	10	14	17	28	20	42	45	13	.....
Total.....	1162	88	43	68	193	209	270	306	431	365	173	8

It will be observed, upon examination of Table LVII, that pneumonia and congestion of the lungs are largely most fatal in the very earliest, and in the most advanced periods of life.

Of the 3,316 decedents in the last fourteen years, more than one-third were under five years of age, and of the remainder, nearly one-half were above the age of sixty years, notwithstanding the greatly lessened number of persons liable to disease, at the advanced age of 60 and over. During fifty-five of the most active years of life, the mortality from the acute diseases of the lungs, scarcely exceeds 0.33 per cent. of the whole.

#### TYPHOID FEVER.

The number of deaths in Rhode Island, in 1878, reported under the general title of "Fevers," was 150. This is 16 more than in 1877, and 24 more than in 1876. The number includes all reported under the following specific terms: "Bilious," 2; "Gastric," 3; "Remittent," 1; "Typhoid or Typhus," 134; "Fever," 10. It is probable that nearly, if not quite all fevers occurring in Rhode Island, are essentially typhoid, the type being modified by a variety of circumstances. Of course the term is not designed to cover all febrile states, dependent on a variety of acute and chronic inflammations.

The following Table shows, for each of the last fourteen years, the whole number of deaths in the State, the number and the percentage, and the sex and the parentage of the decedents from fevers, and the number in each division of the State.

TABLE LVIII.

YEARS.	TYPHOID FEVER.												
	Whole Number of Deaths.	Typhoid Fever.	Per cent.	SEX.		PARENTAGE.		DIVISIONS OF THE STATE.					
				Males.	Females.	American.	Foreign.	Bristol County.	Kent County.	Newport County.	Providence County, Towns.	Providence City.	Washington County.
1865.....	3,405	229	6.4	114	115	149	80	8	17	22	82	79	21
1866.....	2,970	150	5.0	73	77	82	68	7	5	32	54	45	7
1867.....	2,889	119	4.1	60	59	84	35	9	10	17	47	31	5
1868.....	2,912	84	2.9	45	39	57	27	4	5	7	30	23	15
1869.....	3,382	101	3.0	53	48	79	22	7	7	1	37	33	16
1870.....	3,238	153	4.7	66	87	80	73	5	11	14	57	49	17
1871.....	3,344	125	3.7	60	65	69	56	2	8	10	41	51	13
1872.....	4,247	179	4.2	87	92	91	88	4	12	6	75	65	17
1873.....	4,403	172	3.9	73	99	113	59	4	9	9	61	56	33
1874.....	4,229	117	2.8	57	60	56	61	1	10	3	37	58	8
1875.....	4,317	147	3.4	73	74	90	57	1	4	6	49	69	18
1876.....	4,116	126	3.0	65	61	71	55	5	9	13	44	33	22
1877.....	4,450	134	3.0	63	71	65	69	8	10	8	52	44	12
1878.....	4,441	150	3.4	68	82	77	73	13	15	7	62	58	14
Total.....	52,343	1,986	3.1	957	1,029	1,163	823	78	132	155	728	694	218

The proportion of deaths from typhoid fever, to the whole number, in 1878, was 3.4 per cent., which is slightly larger than the average of fourteen years, which is 3.1 per cent. Of the *sex* of the decedents, in 1878, 68 were males, and 82 were females; or 45.3 males, and 54.7 females in each 100; or 79.4 males to each 100 females.

For the period of fourteen years, the average proportion is 48.18 males, and 51.82 females in each 100 decedents; or 88.48 males to each 100 females.

In respect to the *parentage* of decedents, the differences in 1878 are less than in respect to sex.

The proportions are 50.13 of American, and 49.87 of foreign, parentage, in each 100 decedents. These proportions are very nearly equal, and differ very largely from the average of fourteen years, which

are 58.55 of American parentage, and 41.45 of foreign parentage, in each 100; or 141.31 of American, to each 100 of foreign, parentage.

The following Table shows the number of decedents from fevers, in each division of ages, in each of the last fourteen years, in the State of Rhode Island:

TABLE LIX.

TYPHOID FEVER.	PERIODS OF LIFE.										
	YEARS.	Under 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 and over. Not stated.
1865.....		35	18	46	54	80	14	18	7	5	2...
1866.....		23	10	21	26	21	16	9	14	10	....
1867.....		17	6	23	33	12	11	8	4	2	2 1
1868.....		10	7	10	21	8	8	10	4	5	....
1869.....		10	8	14	28	9	7	9	8	6	2...
1870.....		15	13	28	39	16	20	7	7	6	1...
1871.....		13	10	20	28	18	16	9	4	5	2...
1872.....		17	18	34	54	20	9	12	11	3	1...
1873.....		27	12	34	31	25	13	13	7	8	2...
1874.....		10	14	26	32	9	5	10	3	6	2...
1875.....		23	14	19	43	18	10	10	6	4	....
1876.....		21	10	15	24	14	9	6	16	6	3 2
1877.....		22	13	13	36	20	8	5	7	2	2 1
1878.....		17	16	27	47	13	11	12	2	3	2...
Total, 14 years.....		260	169	330	406	233	157	138	100	71	21 4

It was remarked on a previous page, that the mortality from pneumonia and congestion of the lungs, was greatest in the very earliest, and in the most advanced periods of life. It is now seen that typhoid fever is more a disease of the middle periods of life, or that, at least, the mortality is greatest between the ages of 15 and 40; more than one-half of the whole number of deaths from typhoid fever, occurring in that more active part of life.



## COMPARATIVE RESULTS.

The following Table shows the percentage of total mortality from several prominent causes, as reported in 1878, in the whole State, and in the several counties of the State; and also the percentages of the same causes in the whole State, in 1876 and 1877:

TABLE LX.

CAUSES OF DEATH.	Whole State, 1878.	Bristol County.	Kent County.	Newport County, Towns.	Newport City.	Providence County, Towns.	Providence City.	Washington County.	Whole State, 1877.	Whole State, 1876.
Accidents (all kinds).....	2.89	2.14	2.41	4.05	3.03	3.52	2.64	2.00	3.10	2.94
Apoplexy and Paralysis.....	4.45	6.43	6.43	13.52	5.76	4.43	3.35	6.03	4.25	4.22
Brain, Diseases of.....	3.28	0.54	4.82	2.70	4.71	3.43	3.45	0.80	3.68	3.75
Cancer.....	2.82	2.67	4.42	2.70	3.14	2.83	2.43	4.02	3.17	2.72
Cholera Infantum.....	3.97	3.74	5.62	1.35	3.14	4.89	3.60	2.01	6.06	6.41
Consumption.....	15.98	12.30	16.47	13.51	10.99	17.51	15.46	18.88	15.52	16.78
Convulsions and Fits.....	2.65	2.67	2.41	4.05	1.57	2.52	2.94	1.61	1.95	2.28
Croup.....	2.30	7.49	1.21	.....	3.67	1.91	1.96	2.01	2.23	2.61
Debility.....	1.91	.....	0.40	.....	1.57	2.91	1.83	1.21	2.65	2.80
Diarrhea.....	1.25	1.60	1.21	.....	1.05	1.30	1.42	.....	2.11	1.87
Diphtheria.....	10.28	11.23	11.64	4.05	10.47	8.11	12.42	4.42	11.56	4.07
Dysentery.....	.95	1.07	2.01	.....	.....	1.30	0.56	2.01	1.22	1.23
Fevers.....	3.94	6.96	5.22	6.75	1.05	4.74	2.64	5.62	3.55	3.69
Heart, Diseases of.....	3.92	2.67	4.42	8.10	4.71	2.91	4.21	5.62	4.28	4.25
Hooping Cough.....	1.28	.....	0.40	.....	.....	0.68	2.18	0.40	0.75	1.33
Hydrocephalus.....	1.65	3.21	0.80	.....	1.57	1.53	1.96	.....	1.29	1.74
Kidneys, Diseases of.....	1.89	2.14	1.21	1.35	1.05	1.61	2.38	0.80	1.57	1.28
Liver, Diseases of.....	1.06	3.74	0.40	4.05	.52	1.07	0.86	0.80	1.06	1.13
Marasmus.....	1.30	1.60	.....	.....	1.05	0.77	1.96	0.40	0.90	1.13
Pneumonia and Congestion of Lungs.....	7.49	5.35	4.42	4.05	7.85	8.41	7.10	11.24	5.31	8.69
Scarlatina.....	2.03	1.60	2.01	4.05	.....	1.07	2.89	1.61	1.46	2.05

It will be understood that the percentages of the preceding Table are calculated on the basis of the whole number of deaths from *specified causes*, in the whole State, and in the several divisions of the State in which the deaths from the several named causes occurred.

The great variations in the percentages of deaths from the same diseases, in the different sections of the State, in the year 1878, and also the variations of one year from another, in the percentages of mortality from the different causes of death in the whole State, in the last three years, are very clearly shown in the above Table.

It should not be forgotten, however, in an examination of the Table, that the percentages are for named causes of deaths reported, as before remarked, and *not in proportion to population*. For instance, in Newport county towns, where but an exceedingly small proportion of the inhabitants are engaged in mechanical industries at all hazardous to life, the percentage of mortality from accidents of all kinds, in 1878, is 4.05, while in Providence county towns, where the population is very largely engaged in manufacturing and other pursuits, where life is exposed to danger, the percentage of the same causes of death is only 3.52. The reason of the larger per cent. in Newport county towns, is not from the large proportion of accidents to the population, but to the small number of deaths. The number of deaths from accidents was only 3, the whole number of deaths from known causes 74, therefore the percentage 4.05. Now if we reckon the proportion of deaths from accident, *to the population*, we shall find that it is less in Newport county towns, than in Providence county towns; that is, as one in every 2,619, in the first, to one in every 1,831 in the last division.

The same may be said of the mortality from apoplexy and paralysis, the percentage of which is greatly in excess, in Newport county towns, of any other division of the State, solely from the fact of the small proportion of deaths to population, from all other causes.

In regard to the general results, for the whole State, in the comparison of one year with another, there will be found some causes of death showing a considerable disparity of percentages, and some maintaining in all the years, an approximately fixed ratio.

In the first class, we shall find cholera infantum, ranging from 3.97 per cent., in 1878, to 6.41 per cent., in 1876.

Diphtheria, showing a percentage of 10.28, in 1878; 11.56, in 1877, and 4.07 per cent., in 1876.

Whooping cough, pneumonia and scarlet fever, show considerable differences in percentage of mortality in the different years.

In the second class, are found apoplexy and paralysis, consumption, fevers of all kinds, diseases of the heart, diseases of the liver, &c.

The comparative results in the different divisions of the State, in 1878, show very marked disparity. Apoplexy and paralysis, as before alluded to, have a remarkably large percentage in Newport county towns, that is, 13.52; more than three times as large as the average of the whole State, which is 4.45, while Providence city has a percentage of only 3.35.

Of diseases of the brain, Bristol county shows only 0.54 per cent., while Kent county reports a proportion of 4.82 per cent.; more than nine times larger than Bristol county.

Cholera infantum ranges from 1.35 per cent., in Newport county towns, to 5.62 per cent., in Kent county.

The smallest percentage from consumption was in Newport city, 10.99; the largest was in Washington county, 18.88. The average of the whole State was 15.98 per cent.

The percentage from croup varied from 0.00, in Newport county towns, and 1.21 in Kent county, to 7.49 in Bristol county.

Diphtheria was more evenly distributed, in 1878, than in 1877, with a less number of deaths. Newport county towns, returning no deaths from that cause in 1877, show a percentage of 4.05, in 1878; and Newport city, which returned only 1.19 per cent. mortality from diphtheria, in 1877, returns 10.47 per cent., in 1878. Providence city reports the largest percentage, 12.42; about one-fifth less than the previous year.

The percentage of deaths from fevers of all kinds, was very small in Newport city, 1.05; and very large in Newport county towns, 6.75; and Bristol county, 6.96. The average of the State is 3.94 per cent.

Diseases of the heart were also largely fatal in Newport county towns, 8.10 per cent; the State average being 3.92 per cent.

The percentage of pneumonia and congestion of the lungs, always a large factor in the mortality of the State, was especially such in 1878, with a percentage of 7.49; though less somewhat than in 1876, when it was 8.69 per cent. The percentages in the different divisions varied from 4.05 per cent., in Newport county towns, to 11.24 per cent., in Washington county.

These comparisons are already sufficiently extended to direct the attention of the reader to the almost endless relations, that causes of death bear to each other, in the same and in different years, and different localities; and if sufficient interest is felt, the subject can be pursued to a very great length.

## RESULTS OF REGISTRATION.

The preceding statistics, compiled from the Registration Returns of the State, for the year 1878, with observations, comparisons and comments on the same, prepared by the Secretary, will present not only the most comprehensive report of the social and sanitary condition of the State during that year, having relation to the objects for which the State Board of Health was established, but will also afford a very good sanitary history of the births and deaths, in their various relations, for more than a quarter of a century. The value of averages in vital statistics, for long periods of time, has been often alluded to in the preceding pages, and need not be repeated here. In the preceding Tables, may be found a mine of study and speculation in regard to conclusions, which the comparisons of the results of many years registration seem to warrant.

## REPORTS FROM LOCAL BOARDS OF HEALTH.

In this State the town councils of the several towns, and the boards of aldermen in the cities of Providence and Newport, are by General Statutes constituted the local boards of health in their respective towns and cities; unless the said town councils and boards of aldermen appoint a special board of health; and the clerks of the town councils and boards of aldermen, are by law clerks of the local boards of health unless relieved by special municipal ordinance.

Clerks of local boards of health, in whatever locality, must, from their official position, have more or less knowledge of the prevalence of diseases affecting considerable numbers of persons in their several localities, and especially if those diseases are dangerous to life; or result in serious disability at, and during the time of occurrence, or for a more lengthened period of time. They also, especially in the country towns, would most probably be informed of the existence of any generally suspected *source* of disease, within the limits of their own towns, or of any *source* of temporary or prolonged ill health, and also of the presence of any disease among animals affecting large numbers, whether incidental to the locality or epidemic by contagion or infection, and especially if attended with considerable fatality.

It would seem quite reasonable, or rather, it would seem quite essential, that it should be the duty of the clerks of the said local boards of health, to report, in the interests of public health, the occurrence and the continued existence of any of the circumstances above named,

to the Secretary of the State Board of Health, to the end that the Board, if deemed desirable, might investigate the causes of the prevailing diseases, or presumed source of general ill health, with the purpose of the prevention, removal or restriction of the same, as far as possible.

In furtherance of this object, it is the design of the Secretary to ask of the Honorable the General Assembly the enactment of a law by which it shall be made the duty of clerks of local boards of health, to give information to the Secretary of the State Board of Health, upon inquiry, of such facts and circumstances as shall have come to their knowledge.

In this way there may be afforded the Board some valuable opportunities for complying with that section of the act by which it was established, which provides as follows:

“The Board shall take cognizance of the interests of life and health among the citizens of the State; they shall make investigations into the causes of disease, and especially of epidemics and endemics among the people, the sources of mortality, and the effects of localities, employments, conditions and circumstances on the public health, and shall faithfully do all in their power to ascertain the causes and the best means for the prevention of diseases of every kind in the State.”

Such a law as proposed, would doubtless commend itself to the good judgment of the legislators, as being just to the public and the State, and also necessary to the best efficiency of the Board of Health. The service required of clerks of the local boards, would ordinarily require not more than five minutes of time, and if extended information was desired, full compensation for such extended service would be offered. It is not designed, however, that such clerks of town councils or local boards of health, shall be *required* to make personal efforts to obtain a knowledge not already in their possession, but to give such information in reply, as the facts and circumstances already known will warrant.

#### REPORTS OF PREVALENT DISEASES.

The attempt to obtain from the several towns of the State monthly reports of the diseases of importance, prevailing in them during the months reported, with the average degree of severity of the same, and in those attended with fatal results, the estimated percentage of mortality; and also reports of the general amount of sickness of all kinds,

compared with corresponding months of preceding years, has been successful to some extent, but not to so great an extent as has been desired.

The physicians who have been called upon to give uncompensated service to the State, are practitioners whose time is valuable to themselves, and to whom any leisure hours they may have from their arduous professional duties, seem to be needed for such recreation and repose, as a needful preservation of good health would demand. Under such circumstances it has not been surprising that some who promised to do what they could, in advancing the sanitary interests of the State, have found the prompt and regular labor required in the monthly reports, somewhat irksome and distasteful, and so have from lack of energy or inclination, or from forgetfulness, or feeling of needed repose, dropped out of the ranks of regular correspondents and cease to be heard from.

This experience is, however, that of all associations or individuals, who have desired continuous service for lengthened periods of time without compensation, depending for the continuance of the labor, on the interest and enthusiasm of the correspondent in the work engaged.

And this has especially been the experience of boards of health, sanitary associations, and private individuals, engaged in collecting from whatever source they may, such bits of information, narrative of circumstances and accounts of facts, as shall serve their purpose.

The experience of the Secretary has, however, not been at all disheartening, but rather a stimulant and incentive to further effort, and especially as the better class of original correspondents still remain, and comprise also a majority of all, and their circuits of labor include all important portions of the State.

It is a question now whether for the period of time, too much was attempted to be accomplished by the comprehensive series of questions proposed to correspondents for the year 1879. The best methods of ascertaining the diseases incident to localities, and from thence seek their causes, will become more and more apparent, as the attempts to obtain a record and report of the same are prolonged, and the difficulties noted.

Such changes will be made in the questions proposed, and such methods of reply suggested, as from time to time may seem to be best adapted to the circumstances and the occasion.

The following circular to regular correspondents, was issued early in the year:

## (CIRCULAR D.)

## FROM THE OFFICE OF THE STATE BOARD OF HEALTH.

*To the Correspondents of the Board:*

1. What diseases of importance have prevailed in your section during the preceding month? Please give names in the order of greatest prevalence, in first column of blank "Return of diseases."

2. Please state in second column of blank return, the average degree of severity, the sign + signifying a severe form, the sign — an average, and the sign — a mild form.

3. What has been the approximate ratio of deaths to whole number of cases of each disease?

4. What has been the average amount of sickness of all kinds in your section, in proportion to the population, during the month reported, compared with the corresponding month of the year 1878? For increase use sign +, for average or same amount sign — and for decrease sign — in column 4.

5. Please state percentage of increase in column 5.

6. Please state percentage of decrease in column 6.

7. What has been the proportion of deaths from all diseases, compared with the same, during the corresponding month of the previous year, taking into account the increase or decrease of population, if any?

8. What disease or diseases, if any, unusual in your section, or at the period of the year reported, prevailed during the month?

9. What was the degree of severity of the same?

10. What was the percentage of mortality of the same?

11. What diseases were notably few in number, or absent, that usually are notably prevalent during the period reported?

12. What diseases among animals, if any, were prevalent during the month?

13. What the degree of severity, of any disease prevailing among animals, if any?

14. What the percentage of deaths from any disease among animals, if any?

15. Has the average of falling water from snow or rainfall been greater or less during the month, than the average for the corresponding months of previous years?

16. Has the average temperature of the atmosphere for the month, been higher or lower than the average of same month?

17. Has the temperature been more steady, or more fluctuating than usual?

18. Has the range of fluctuation been greater or less than usual?

19. Has there been an excess, or unusual diminution of moisture in the atmosphere during the month?

20. Has there been any unusual absence, or excess of moisture in the soil?

21. Please state the number of diseases, believed to be caused primarily by some deleterious agent, condition or circumstance, the number of cases of each set down in numerals, in the column following the name of the cause. For instance, Alcohol in some form, Coffee, Opium, Over-work, physical or mental, Occupation, Scrofula, Tea, Tobacco, etc. (See blank return partly filled.)

22. Please state number of deaths during the month from accident, and cause or kind, as from explosion of gas, kerosene, naphtha, or from whatever cause. Particulars are desirable. Kind of accident given in columns 4, 5 and 6 of RETURN and number of deaths in column 7.

23. Please also give number of cases of evident poisoning from any cause whatever. Name of poison in columns 4 and 5, number of cases in column 6, and number of deaths in column 7.

24. Please report any facts, that have come to your knowledge in regard to the communicability of diseases, the origin of infection, by what means conveyed, how long contagion had probably been dormant, mode of invasion, progress, etc.

25. Please also give your opinion, in regard to the manner in which infection acts to produce disease, or the various modes in which different kinds of infection act to produce each its specific form of disease.

26. Please also give notice of any source of disease known to you, which is removable, and any suggestions that occur to you, as a means of preventing sickness.

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Any facts or suggestions coming under any questions in relation to the cause or prevention of disease, will be favorably received, and will go into the next report of the State Board of Health, with such comments and conclusions as the facts seem to warrant, and with the names of the authors unless otherwise ordered.

Physicians receiving this circular, and not having heretofore signified their willingness to act as regular correspondents, will confer a favor on the Board, and also the public at large, by filling up the blank RETURN for the month of January. Those who do so will have their names entered on the list of regular correspondents, and postage stamps will be forwarded them, for payment of postage on RETURN for January, together with stamped envelopes and blank RETURNS for future reports. Any additional postage incurred by sending to the Board extended remarks concerning any topic, immediately or remotely connected with sanitary science, will be refunded at once by the Secretary.

Questions not having blank spaces on the RETURN for reply, may be answered on any unoccupied space, or on a separate sheet of paper, each reply having a numeral prefixed, corresponding to the number of the question replied to.

Please keep this circular in your journal or ledger for future reference.

The object of the preceding questions will be apparent by brief explanations, if it does not appear upon their face. "To make investigations into the causes of disease," the diseases must first be found, and the places in which they occur. To ascertain "the effects of localities, employments, conditions and circumstances on the public health," as the law directs, the diseases or departures from normal health, that occur or have their origin, or development, or advancement in the localities, or under the conditions and circumstances conducive to the same, must first be made known; and to be made known,



for sanitary purposes, there must be a *report of the kinds of diseases*, prevailing at different periods of the year, in all the different localities in the State, and the conditions and circumstances under which they occur. For instance, if in a certain village, there occurred among families using water from the same well or different wells, the water in which was derived from the same pond, stream or other source, and members of these different families should have attacks of dysentery, diarrhoea, or some other disease dangerous to life, or dyspepsia or some other obscure but disabling complaints, affecting a considerable number in a similar way, and it should be found that these diseases occurred when the streams and wells were low, and were the severest when the water was lowest, and other persons in the same vicinity not using the same water, were not affected in the same way, it would afford presumable evidence that some impurity in the water, more concentrated by there being less water to dilute it, was the cause of the peculiar kinds of disease. The causes of disease in different localities, are, and will be found to be quite different, but they are doubtless, in a considerable proportion removable, and their presence can only be found as indicated above, by reporting diseases as well as deaths, and as far as possible, the circumstances surrounding the persons sick, and the regularity of occurrence, under the same circumstances.

It will be understood, that the degree of temperature and moisture of the atmosphere, the condition of the soil, the rainfall, not alone as furnishing a dry or humid soil, but as affecting vegetation, the disorganization and putrefaction of vegetable and animal substances, may all have influences indirectly, if not directly, in producing or modifying causes of disease, which may be largely avoided if known. But a multitude of observations must be made, a multitude of events and circumstances having relation to, or resulting in decided and definite disease, must be recorded and compared, to arrive at one definite conclusion, or produce a single fact; and only by a single fact brought to light here, and another there, and others elsewhere, can sanitary science be put on a firm basis, and the laws governing human health be established.

#### RETURNS OF DISEASES.

The blank "Return of Diseases," furnished regular correspondents, for reporting prevalent diseases and various attendant circumstances, in their several localities, monthly, in reply, in part, to the series of questions already presented, was as follows:

FORM OF BLANK

RETURN OF DISEASES.

## RETURN OF DISEASES, &amp;c.

In the ..... and surrounding territory, for the month of ....., 1879.

1. Diseases of importance prevailing during the month, numbered in order of greatest prevalence.	2. Degree of severity.		3. Ratio of mortality.	4. Comparative amount of general sickness.		5. Ratio of increased sickness.	6. Ratio of deaths to whole number of cases of sickness.		7. Ratio of deaths to whole number of cases of sickness.	8. Unusual diseases prevalent during the month.	9. Degree of severity.	10. Ratio of mortality.
	+ Severe.	- Mild.		+ Increased.	- Decreased.		per cent.	per cent.				
1. Pneumonia or congestion of lungs, 2. Diphtheria, 3. Scarlet Fever, 4. Rheumatism, Acute,	+		.08	+ Accidenta, death from,					No.	Dysentery,	+	.06
	+		.15	} Kind. 23. Poisoning, Causes, Wall paper, Lead, Other Poisons.					No.	Diarrhea,	-	.00
	+		.02						No.			
	+		.04			Paris Green,	2	0	1			

## RETURN OF DISEASES, &amp;c.—Continued.

11. Usual diseases not prevalent during the month.	12. Diseases of animals prevalent.	13. Degree of severity.	14. Ratio of mortality.	Meteorology, and presumable causes of diseases.	For increase use sign +, for average —, for decrease —.
1. Acute Catarrh, 2. Influenza, 3. Acute Bronchitis,	Hog Cholera, Pleuro Pneumonia,	+ —	per cent. .50 .50	15. Snow or rainfall greater or less, 16. Mean Temperature higher or lower than average, 17. More or less fluctuating, 18. Range of fluctuation greater or less, 19. Humidity of atmosphere greater or less, 20. Humidity of soil greater or less, 21. Presumable cause of disease, Alcohol, Coffee, Opium, Overwork, physical, "          mental, Occupation, Scrofula, Tea, Tobacco, Vice,	+ — + + — — No. of cases. 2 2 1
				} Other causes.	

N. B.—This return is filled in part, to show the mode of filling. See names of diseases in columns 1, 8, 11, 12, and 23. See also signs and decimals in columns 2, 3, &c.

For Locality.—If this return is from a city, fill up with city of ..... If from compact towns, like Pawtucket and Woonsocket, fill up with town of ..... If from village, fill up with village of .....

It will be observed on examination, that the spaces on the "*Return*" and the numbered headings of the same, correspond with the numbers of the questions on Circular D., to which reference might at any time be made if desired.

There having been some delay in preparing and printing the blank "Returns of diseases," the following circular, presenting explanations, and some additional suggestions, was forwarded to correspondents with the Circular D. and the blank "Returns."

### (CIRCULAR E.)

#### OFFICE OF SECRETARY OF THE STATE BOARD OF HEALTH.

PROVIDENCE, Feb. 21st, 1879.

DEAR DOCTOR:

Herewith I send a series of questions, and blank for reply in such manner as will give you the least possible trouble in the way of statement. It will be seen that Circular D. refers to the month of January only, but the delay in printing has carried the time so far along, that if you can make reply for January and February on the same sheet please do so, designating the respective months by abbreviations or in such manner as you may suggest.

These replies of course can only be *general* and *approximate*, but coming from all parts of the State, and from reliable persons, will afford a very good estimate, not only of the general amount of sickness, the kinds most prevalent, the general degree of severity and mortality, but, after a sufficient period of time, the relation which the different circumstances bear to the condition of the public health. No advantage will be taken of correspondents, in regard to any communication they may be disposed to make, and no physician's practice can in any way be inquired into. I shall take pleasure in sending you a copy of the Annual Report of the Board, now nearly through the press.

Enclosed please find stamped envelope for *Return*.

Yours very truly,

CHAS. H. FISHER, *Sec.*

Tabulated summaries of the monthly reports will be found in the following pages.

*Tabulated Summary of Reports of acute diseases prevailing in the several towns during*

JANUARY, 1879.

TOWNS.	Bronchitis.	Croup.	Dysentery.	Diphtheria.	Hooping Cough.	Influenza.	Pneumonia and Pleurisy.	Rheumatism.	Scarlatina.	Pharyngitis.	Diseases of Brain.	Degree of severity.	Humidity of atmosphere.	Temperature.	Fluctuations.
Barrington*.....	1 s.	5 m.	3 a.	2	2	2	2	2	2	2	2	2	2	2	2
Bristol.....	4 s.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.
Warren.....	1 s.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.
Coventry.....	3 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.
East Greenwich.....	3 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.
West Greenwich.....	1 m.	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Warwick.....	2 a.	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Little Compton.....	2 a.	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Middletown.....	2 a.	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Portsmouth.....	3 a.	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Tiverton.....	2 a.	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Newport City.....	2 a.	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Burrillville.....	2 a.	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Cranston.....	4 a.	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Cumberland.....	3 a.	4	4	4	4	4	4	4	4	4	4	4	4	4	4
East Providence.....	4 a.	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Foster.....	3 a.	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Gloster.....	3 a.	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Johnston.....	3 a.	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Lincoln.....	1 s.	5 m.	5 m.	5 m.	5 m.	5 m.	5 m.	5 m.	5 m.	5 m.	5 m.	5 m.	5 m.	5 m.	5 m.
North Providence.....	4 a.	4	4	4	4	4	4	4	4	4	4	4	4	4	4
North Smithfield.....	4 a.	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Pawtucket.....	3 a.	5 a.	5 a.	5 a.	5 a.	5 a.	5 a.	5 a.	5 a.	5 a.	5 a.	5 a.	5 a.	5 a.	5 a.
Scituate.....	3 a.	5 a.	5 a.	5 a.	5 a.	5 a.	5 a.	5 a.	5 a.	5 a.	5 a.	5 a.	5 a.	5 a.	5 a.
Smithfield.....	4 a.	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Woonsocket.....	4 a.	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Providence City.....	3 s.	4 a.	4 a.	4 a.	4 a.	4 a.	4 a.	4 a.	4 a.	4 a.	4 a.	4 a.	4 a.	4 a.	4 a.
Charlestown.....	4 s.	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Exeter.....	5 m.	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hopkinton.....	5 m.	4	4	4	4	4	4	4	4	4	4	4	4	4	4
North Kingstown.....	5 a.	4	4	4	4	4	4	4	4	4	4	4	4	4	4
South Kingstown.....	4 s.	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Richmond.....	4 s.	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Westerly.....	4 a.	4	4	4	4	4	4	4	4	4	4	4	4	4	4

\* N. B.—Figure 1, indicates the disease affecting the largest number of persons. Fig. 2, the next largest number, and so on. The letters following the figures denote the degree of severity, s. signifying severe, a. average, and m. mild. The letters in the meteorological columns indicate as follows: g. greater, l. less or lower, a. average, h. higher. They show the relative temperature, humidity, and frequency of change compared with the average of corresponding months of previous years.

*Tabulated Summary of Reports of acute diseases prevailing in the several towns during*

FEBRUARY, 1879.

TOWNS.	Bronchitis.	Deg. of severity.	Croup.	Deg. of severity.	Diphtheria.	Deg. of severity.	Whooping Cough.	Deg. of severity.	Catarrhal Inflammation.	Deg. of severity.	Scarlatina.	Deg. of severity.	Pharyngitis and Quinsy.	Deg. of severity.	Mumps.	Deg. of severity.	Krysipelas.	Deg. of severity.	Humidity of atmosphere.	Temperature.	Miscellaneous.
Barrington*.	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bristol.	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Warren.	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
East Greenwich.	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
West Greenwich.	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Warwick.	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Little Compton.	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Middletown.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Portsmouth.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tiverton.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Burrillville.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cranston.	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Cumberland.	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
East Providence.	0	0	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Foster.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Glocester.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Johnston.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lincoln.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
North Providence.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
North Smithfield.	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Pawtucket.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scituate.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Smithfield.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Woonsocket.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Providence City.	2	2	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Charlestown.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exeter.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hopkinton.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
North Kingstown.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South Kingstown.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Richmond.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Westerly.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

\* For explanation see foot note page 157.

## MARCH AND APRIL.

The reports of prevailing acute diseases, not contagious or infectious, in the different towns, for the months of March and April, were so uniform in the statement, that it was difficult to say, which, among the four or five most prominent diseases prevalent, affected the largest number of persons, and the range of diseases was so limited, that it has seemed unnecessary to present the returns in tabular form for those months.

The names of the acute diseases prevailing during those months are given, with the understanding that all, not contagious or infectious, were uniformly above the average degree of severity, and were very evenly distributed throughout the State. They were as follows, and with slight variations, were in the degree of greatest prevalence, in the order in which they are here given, viz: Inflammation of the throat, acute catarrh, acute bronchitis, inflammation and congestion of the lungs, and rheumatism; croup and inflammation and congestion of the brain were reported, but were of less prevalence.

The contagious or infectious diseases, scarlatina, diphtheria, hooping cough, measles and mumps, were reported in quite limited numbers and generally of mild form, during the months above named, from only a few towns in the State.

These reports, if *faithfully* and *fully* made out in regular monthly periods, will afford facilities for studying the spread of the contagious and infectious diseases, in regard to the mode of transportation or travel, that is, whether they are communicated from one town to another in a direct line of travel as a rule, where communication is frequent and uninterrupted; or whether their mode of travel is by leaping over portions of territory as it were, and reappearing in towns or places at a distance, and not contiguous with those where they had prevailed at a time immediately preceding. If it should be found that any one of the contagious or infectious diseases which is in any important degree fatal to life, moved in any regular and straightforward path, it would be a fact of great value, as affording to those who were seemingly in its line of travel, an opportunity at least to prepare for its approach and presence, if it did not indeed afford the possibility of arresting its progress altogether. It is only by collecting a



great number of observations, and a comparison of them when so collected, that the nature and characteristics of all diseases, whether transmissible or not, can be ascertained. And it is also by a great number of observations made in any town or section, and reported from time to time, that it can be determined, with any degree of accuracy, what diseases that town or section is especially liable to, and what means may be taken for their prevention or restriction.

*Tabulated Summary of Reports of acute diseases prevailing in the several towns during*

MAY, 1879.

TOWNS.	Brain.	Nasal Passages.	Throat.	Bronchial Passages.	Lungs.	Rheumatism.	Croup.	Diphtheria.	Hoopings Cough.	Scarlatina.	Degree of severity.	Typhoid Fever.	Cerebro-spinal meningitis.	Measles.	Krysalp las.	Degree of severity.	Neuralgia and nerve disorders.	Humidity of atmosphere and soil.	Average temperature.	Fluctuations.
Warren*	4 s.	3 m.	2 m.	2 m.	5 s.	1 m.	1 m.												47	30
East Greenwich.	1 a.	4 m.	4 m.	2 a.	2 s.	3 s.	3 s.												47	30
Little Compton.	1 a.	1 a.	1 a.	1 a.	2 s.	4 a.	4 a.		6 m.			3 a.	5 a.						47	30
Tiverton.		2 a.	2 a.	1 s.	1 s.	1 a.	1 a.		3 m.			4 a.					3 a.		47	30
Burrillville.	5 a.	4 m.	4 m.	2 m.	1 a.	3 s.						4 a.							47	30
Cumberland.	1 a.	2 m.	2 m.	3 m.	4 m.	2 m.													47	30
Foster.	1 a.	2 m.	2 m.	3 m.	4 m.	2 m.													47	30
Glocester.	3 a.	1 m.	1 m.	1 m.	1 m.	4 m.													47	30
Johnston.	3 a.	1 m.	1 m.	1 m.	2 m.	3 m.													47	30
Lincoln.	2 m.	3 m.	3 m.	1 m.	2 m.	4 m.													47	30
North Smithfield.	2 m.	3 m.	3 m.	1 m.	2 m.	4 m.													47	30
Pawtucket.	1 a.	3 m.	3 m.	2 m.	3 m.	4 a.			1 m.			5 m.					6 a.		47	30
Scituate.	2 m.	3 m.	3 m.	2 m.	3 m.	4 a.													47	30
Smithfield.	1 a.	3 m.	3 m.	2 m.	3 m.	4 a.													47	30
Woonsocket.	2 s.	2 s.	2 s.	2 s.	2 s.	1 a.													47	30
Providence City.	5 s.	2 m.	1 a.	1 a.	3 s.	1 a.			2 a.	1 s.				4 a.					47	30
Charlestown.	2 m.	1 a.	1 a.	3 m.	3 s.	1 a.													47	30
Exeter.	1 m.	2 m.	2 m.	3 m.	3 m.	4 a.													47	30
Ripkinton.	2 m.	3 m.	3 m.	3 m.	3 m.	4 a.													47	30
North Kingstown.	1 m.	3 m.	3 m.	3 m.	3 m.	4 a.													47	30
South Kingstown.	1 m.	3 m.	3 m.	3 m.	3 m.	4 a.													47	30
Richmond.	1 m.	3 m.	3 m.	3 m.	3 m.	4 a.													47	30
Westerly.	1 m.	3 m.	3 m.	3 m.	3 m.	4 a.													47	30

\* For explanation see foot note, page 157. The fluctuations during May were not only more frequent, but also greater in range of temperature.

*Tubulated Summary of Reports of acute diseases prevailing in the several towns during*

JUNE, 1879.

TOWNS.	Nasal Passages.	Throat.	Degree of severity.	Bronchial Passages.	Degree of severity.	Lungs.	Degree of severity.	Croup.	Degree of severity.	Rheumatism.	Degree of severity.	Diphtheria.	Degree of severity.	Hoopling Cough.	Degree of severity.	Scarlet Fever.	Degree of severity.	Typhoid Fever.	Degree of severity.	Measles.	Degree of severity.	Nervous and nerve de- rangements.	Degree of severity.	Dysentery and Diarrhea.	Degree of severity.	Humidity of atmosphere and soil.	Average temperature.	Fluctuations.
East Greenwich*	.....	.....	.....	.....	.....	6 m.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5 m.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Warwick.....	.....	4 a.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Little Compton.....	.....	1 m.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tiverton.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Newport City.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cumberland.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Glocester.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Johnston.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lincoln.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
North Providence.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
North Smithfield.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pawtucket.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Scituate.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Smithfield.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Woonsocket.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Providence City.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hopkinton.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
South Kingstown.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Westerly.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

\* For explanation see foot note page 157. During June the range of temperature was less, with frequent fluctuations.

*Tabulated Summary of Reports of acute diseases prevailing in the several towns during*

JULY, 1879.

TOWNS.	Nasal Passages.	Throat.	Bronchial Passages.	Lungs.	Diphtheria.	Whooping Cough.	Scarlet Fever.	Typhoid Fever.	Dysentery and Diarrhea.	Cholera Infantum.	Degree of severity.	Cholera Morbus.	Degree of severity.	Humidity of atmosphere and soil.	Average temperature.	Fluctuations.
East Greenwich*	.....	5 m.	.....	.....	.....	.....	.....	1 s.	2 a.	3 s.	1 a.	4 m.	.....	.....	.....	.....
Little Compton	.....	4 s.	.....	.....	3 a.	.....	2 m.	.....	.....	.....	.....	.....	.....	.....	.....	.....
Plymouth	.....	.....	2 a.	.....	1 m.	.....	.....	5 m.	.....	3 s.	.....	4 a.	.....	.....	.....	.....
Tyngboro	.....	.....	3 m.	.....	.....	.....	.....	.....	1 a.	3 s.	.....	4 a.	.....	.....	.....	.....
Burrillville	.....	2 m.	.....	.....	5 a.	.....	4 m.	4 a.	1 a.	3 s.	1 a.	3 s.	.....	.....	.....	.....
Cumberland	.....	.....	2 a.	.....	.....	.....	.....	.....	1 a.	3 s.	.....	3 s.	.....	.....	.....	.....
East Providence	.....	4 m.	.....	.....	.....	5 a.	.....	3 m.	1 m.	3 s.	.....	3 s.	.....	.....	.....	.....
Foster	.....	.....	.....	.....	.....	.....	.....	.....	1 a.	3 s.	.....	3 s.	.....	.....	.....	.....
Glocester	.....	.....	.....	.....	.....	.....	.....	.....	1 a.	3 s.	.....	3 s.	.....	.....	.....	.....
Johnston	.....	.....	.....	.....	5 a.	.....	4 a.	.....	1 a.	3 s.	.....	3 s.	.....	.....	.....	.....
Lincoln	.....	.....	3 a.	.....	.....	.....	.....	.....	1 a.	3 s.	.....	3 s.	.....	.....	.....	.....
North Providence	.....	.....	2 m.	.....	.....	.....	4 a.	.....	1 m.	3 s.	.....	3 s.	.....	.....	.....	.....
North Smithfield	.....	.....	.....	.....	.....	.....	.....	.....	1 a.	3 s.	.....	3 s.	.....	.....	.....	.....
Pawtucket	.....	.....	.....	.....	.....	.....	4 m.	1 a.	2 m.	3 s.	.....	3 s.	.....	.....	.....	.....
Scituate	.....	.....	.....	.....	.....	.....	.....	4 m.	1 a.	3 s.	.....	3 s.	.....	.....	.....	.....
Smithfield	.....	5 a.	2 m.	3 a.	.....	.....	.....	.....	1 a.	3 s.	.....	3 s.	.....	.....	.....	.....
Woonsocket	.....	.....	2 m.	.....	.....	.....	.....	.....	1 a.	3 s.	.....	3 s.	.....	.....	.....	.....
Providence City	3 a.	.....	4 m.	.....	7 a.	6 a.	5 a.	3 a.	1 a.	3 s.	1 a.	3 s.	.....	.....	.....	.....
Westerly	.....	.....	.....	.....	4 m.	.....	.....	3 m.	2 a.	3 s.	1 a.	3 s.	.....	.....	.....	.....

\* For explanation see foot note page 157. The extremes of temperature were less in July than the average of years.

*Tabulated Summary of Reports of acute diseases prevailing in the several towns during*

JUNE, 1879.

TOWNS.	Nasal Passages.	Throat.	Bronchial Passages.	Lungs.	Croup.	Rheumatism.	Diphtheria.	Hoopling Cough.	Scarlet Fever.	Typhoid Fever.	Measles.	Degree of severity.	Neuritis and nerve de-	Dysentery and Diarrhoea.	Degree of severity.	Humidity of atmosphere and soil.	Average temperature.	Fluctuations.
East Greenwich*																		
Warwick		4 a.		6 m.		3 s.	1 m.	4 s.	2 a.	5 m.						1	59	2
Little Compton		1 m.	2 m.			3 m.	1 a.		2 m.							1	59	2
Tiverton		3 s.					1 s.			2 a.						1	59	2
Newton City		2 s.	3 a.	1 m.		1 s.				3 m.				4 m.		1	59	2
Cumherland		1 m.	3 m.	4 s.		2 s.										1	59	2
Gloucester		1 m.	2 m.		4 a.	2 s.										1	59	2
Johnston		1 m.	2 m.			3 m.			5 a.							1	59	2
Lincoln		1 m.	2 m.			3 m.										1	59	2
North Providence		2 a.	1 a.	2 m.		3 m.	1 m.		3 a.	4 m.						1	59	2
North Smithfield		2 a.	1 a.	2 m.		3 m.										1	59	2
Pawtucket		1 a.	2 a.	2 m.	3 a.	3 m.										1	59	2
Scituate		1 a.	2 a.	2 m.	3 a.	3 m.										1	59	2
Smithfield		2 m.	1 m.	2 m.	3 a.	3 m.										1	59	2
Woonsocket		2 m.	1 m.	2 m.	3 a.	3 m.										1	59	2
Providence City		1 m.	2 m.	2 a.		3 m.	1 a.		4 a.	3 a.						1	59	2
Hopkinton		1 m.	2 m.	2 a.		3 m.										1	59	2
South Kingstown		1 m.	2 m.		3 m.	1 a.	6 m.	4 m.								3	59	2
Westerly		5 a.														3	59	2

\* For explanation see foot note page 157. During June the range of temperature was less, with frequent fluctuations.

*Tubulated Summary of Reports of acute diseases prevailing in the several towns during*

JULY, 1879.

TOWNS.	Nasal Passages.	Degree of severity.	Throat	Degree of severity.	Bronchial Passages.	Degree of severity.	Lungs.	Degree of severity.	Diphtheria.	Degree of severity.	Whooping Cough.	Degree of severity.	Scarlet Fever.	Degree of severity.	Typhoid Fever.	Degree of severity.	Dysentery and Diarrhea.	Degree of severity.	Cholera Infantum.	Degree of severity.	Cholera Morbus.	Degree of severity.	Humidity of atmosphere and soil.	Average temperature.	Fluctuations.
East Greenwich*			5 m.						8 a.				2 m.		1 s.		2 a.		3 s.		4 m.		3 s.		
Little Compton			4 s.						1 m.						5 m.				3 s.		4 s.		4 s.		
Portsmouth					2 a.				1 m.										3 s.		4 a.		4 s.		
Tiverton					3 m.				5 a.				4 m.		4 s.		1 a.		3 a.		3 m.		3 s.		
Burrillville.			2 m.																3 a.		3 m.		3 s.		
Cranston					2 a.										3 m.		1 m.		2 a.		2 a.		3 s.		
Cumberland					4 m.														2 a.		2 a.		3 s.		
East Providence.																			2 a.		2 a.		3 s.		
Foster.																			2 a.		2 a.		3 s.		
Glocester																			2 a.		2 a.		3 s.		
Johnston									5 a.				4 a.				1 a.		3 a.		3 s.		4 s.		
Lincoln					2		3 a.						4 a.				1 m.		3 a.		3 s.		4 s.		
North Providence																			3 a.		3 s.		4 s.		
North Smithfield.	3 a.				2 m.														3 a.		3 s.		4 s.		
Pawtucket																			3 a.		3 s.		4 s.		
Scituate																			3 a.		3 s.		4 s.		
Smithfield					2 m.		3 a.												3 a.		3 s.		4 s.		
Woonsocket.			5 a.		2 m.														3 a.		3 s.		4 s.		
Providence City	3 a.				4 m.														3 a.		3 s.		4 s.		
Westerly									7 a.				5 a.		3 m.		1 s.		2 a.		2 a.		3 s.		
									4 m.						3 m.		2 a.		2 a.		2 a.		3 s.		

\* For explanation see foot note page 157. The extremes of temperature were less in July than the average of years.

*Tabulated Summary of Reports of acute diseases prevailing in the several towns during*

AUGUST, 1879.

TOWNS.	Bronchial Passages.	Diphtheria.	Scarlet Fever.	Typhoid Fever.	Dysentery and Diarrhea.	Cholera Infantum.	Cholera Morbus.	Krypnelas.	Rheumatism.	Degree of severity.	Humidity of soil and atmosphere.	Average temperature.	Fluctuations.
East Greenwich*	4 m.			1 a.	3 m.	3 a.	2 m.				a	1	2
Warwick		3 a.			1 a.	1 m.	2 a.	4 m.	5 m.		a	1	2
Little Compton		3 a.	4 a.		1 a.	3 a.	2 a.				a	1	2
Portsmouth					1 a.	3 a.	2 a.				a	1	2
Tiverton	4 a.				1 a.	3 a.	2 a.				a	1	2
Cranston			5 m.	4 m.	1 a.	3 a.	2 a.				a	1	2
Cumberland				5 a.	1 a.	3 a.	2 a.		3 m.		a	1	2
East Providence	4 m.				1 a.	3 a.	2 m.				a	1	2
Foster					1 a.	3 a.	2 m.				a	1	2
Glocester	3 m.				1 m.	3 a.	2 m.				a	1	2
Johnston				4 m.	1 a.	3 a.	2 m.				a	1	2
Lincoln				4 m.	1 a.	3 a.	2 m.				a	1	2
North Providence			5 m.	4 a.	1 a.	3 a.	2 m.		4 a.		a	1	2
North Smithfield				3 a.	1 a.	3 m.	3 a.				a	1	2
Pawtucket		5 m.		3 a.	1 a.	3 m.	3 a.				a	1	2
Scituate	5 m.			3 m.	1 a.	3 a.	4 a.				a	1	2
Smithfield				3 m.	1 a.	3 a.	4 a.				a	1	2
Woonsocket				3 m.	1 a.	3 a.	4 a.				a	1	2
Providence City	4 m.	8 m.	5 a.	6 m.	2 a.	1 a.	3 m.		7 m.		a	1	2
South Kingstown	3 m.		3 m.	3 m.	1 m.	4 m.	3 m.				a	1	2
Westerly		6 a.	4 a.	5 a.	2 a.	1 a.	3 a.				a	1	2

\* For explanation see see foot note page 157. The variations of temperature in August were less in degree, fluctuations frequent.

*Tabulated Summary of Reports of acute diseases prevailing in the several towns during*

SEPTEMBER, 1879.

TOWNS.	Throat.	Bronchial Passages.	Lungs.	Diphtheria.	Scarlet Fever.	Typhoid Fever.	Dysentery.	Diarrhea.	Cholera Infantum.	Degree of severity.	Rheumatism.	Degree of severity.	Humidity of soil.	Average Temperature.	Fluctuations.
Bristol*	3 m.												1	4	a
Warren	4 a.												1	1	a.
East Greenwich			6 s.	2 m.	3 m.	8 m.	3 m.	1 m.	5 m.	1 m.	4 m.	5 m.	1	1	a.
Warwick				3 m.		1 m.	4 m.	5 m.		1 m.	2 m.	3 m.	1	1	a.
Little Compton	6 m.					2 m.	1 m.	1 m.		1 m.	3 m.	3 m.	2	1	a.
Portsmouth				4 m.	1 a.	4 a.	1 m.	1 m.		1 m.	2 m.	2 m.	1	1	a.
Tiverton				3 m.	6 m.	4 a.	2 m.	2 m.		1 m.	5 m.	5 m.	a.	1	a.
Cumberland		4 m.	3 s.	4 a.		3 m.	1 m.	1 m.		1 m.	1 m.	1 m.	1	1	a.
East Providence			5 a.			1 a.		1 m.		1 m.	1 m.	1 m.	1	1	a.
Foster		2 m.								1 m.			1	1	a.
Glocester		2 m.								1 m.			1	1	a.
Johnston			5 m.	1 m.	2 a.	3 a.	2 a.	4 m.		1 m.	5 m.	5 m.	1	1	a.
Lincoln		4 m.	3 s.	3 m.	6 m.	1 m.	2 a.	1 m.		4 m.			a.	1	a.
North Providence.			5 a.	3 m.	2 a.	4 m.	1 a.	4 a.		1 m.			1	1	a.
Pawtucket.		3 m.								1 m.			1	1	a.
Scituate		4 m.		2 a.	1 s.			1 m.		1 m.	2 m.	2 m.	1	1	a.
Providence City	3 a.	7 m.	3 a.	5 m.	4 m.	1 m.	1 m.	2 m.	4 a.	3 m.	4 m.	4 m.	1	1	a.
Charlestown.	6 a.	6 a.						2 m.		2 m.			1	1	a.
Hopkinton				3 a.				1 m.		2 m.			1	1	a.
North Kingstown				3 a.				1 m.		2 m.			1	1	a.
South Kingstown				3 a.				1 m.		2 m.			1	1	a.
Richmond				3 a.		2 m.	2 a.	1 m.		1 a.	4 m.	4 m.	1	1	a.
Westerly		7 a.		6 m.	5 s.	4 m.	2 m.	1 m.		1 a.			1	1	a.

\* For explanation see foot note page 157. Temperature unusually uniform through the month.



*Tabulated Summary of Reports of acute diseases prevailing in the several towns during*

OCTOBER, 1879.

TOWNS.	Throat.	Bronchial passages.	Lungs.	Diphtheria.	Scarlet Fever.	Typhoid Fever.	Dysentery and Diarrhea.	Rheumatism.	Degree of severity.	Croup.	Degree of severity.	Humidity of soil and atmosphere.	Average Temperature.	Fluctuations.
Bristol*	2 a.	4 a.				1 m.	3 m.	3 m.	1 m.					
Warren	3 a.					1 m.	1 a.	1 m.	1 a.					
East Greenwich.			6 s.	2 m.	3 m.	1 m.	1 a.	4 m.	1 a.					
Warwick.		4 m.		3 m.										
Little Compton.		2 a.	1 s.			1 m.	1 m.	2 m.	2 a.					
Porismouth.				3 a.	1 a.	4 a.	4 a.	3 m.	3 m.					
Riverton.		1 a.	2 s.				2 m.	3 m.	3 m.					
Cumberland.		3 a.	2 m.	1 m.	5 m.		4 a.	3 m.	3 m.					
East Providence.		3 m.			4 a.	1 m.	1 m.	2 m.	3 m.					
Foster.		3 m.						1 m.	1 m.					
Gloicester.														
London.	6 a.		4 a.	2 m.	1 s.	3 m.	1 m.	3 m.	3 m.					
Lincoln.		2 m.	1 s.		5 m.		4 m.	3 m.	3 m.					
North Providence.		4 a.	2 a.			1 m.	3 m.	3 m.	3 m.					
Pawtucket.	5 a.	4 a.	3 a.			1 m.	3 m.	3 m.	3 m.					
Scituate.		3 m.	3 a.	2 a.	1 a.	6 m.	3 m.	4 a.	4 a.					
Providence City.	4 a.					2 m.	1 m.	3 m.	3 m.					
Charlestown.		5 a.				2 m.	1 m.	3 m.	3 m.					
Hopkinton.		3 a.		4 m.	3 m.	1 a.	1 a.	3 m.	3 m.					
South Kingstown.				3 a.		2 m.	1 a.	3 m.	3 m.					
Westerly.	4 a.	5 a.		3 a.	3 s.	2 m.	1 a.	3 m.	3 m.					

\*For explanation see foot note page 157. Temperature quite uniform for the month

*Tabulated Summary of Reports of acute diseases prevailing in the several towns during  
NOVEMBER, 1879.*

TOWNS.	Nasal Passages.	Throat.	Bronchial Far-	Rages.	Lungs.	Diphtheria.	Scarlet Fever.	Typhoid Fever.	Dysentery and Diarrhea.	Rheumatism.	Whoop'g Cough.	Measles.	Deg. of severity.	Humidity of atmosphere.	Average temperature.	Fluctuations.
Barrington*.	1 m.			3 m.	2 a.		4 a.			5 m.						
Bristol.	1 s.	3 a.		2 a.	3 a.		4 a.			4 m.						
Coventry.	2 a.	4 m.		1 m.	1 a.		4 a.			3 a.						
East Greenwich.		4 a.		5 m.	1 m.					3 m.						
West Greenwich.		4 a.		2 m.	1 m.		2 a.			4 m.						
Warwick.		2 m.		2 a.	1 s.		1 a.			3 m.						
Little Compton.		4 s.		1 m.	1 m.											
Middletown.		2 m.		2 m.	1 m.					3 m.						
Portsmouth.		3 a.		1 a.	2 m.					4 m.						
Norton.		2 m.		1 m.	3 m.					5 m.						
Newport City.	1 a.	2 m.		2 m.	3 m.		1 a.			4 m.						
Burrillville.		4 s.		1 a.	3 m.		3 a.			4 m.						
Cranston.		2 a.		1 a.	3 m.		3 a.			5 m.						
Cumberland.		2 a.		1 a.	3 m.		3 a.			4 m.						
East Providence.		1 m.		2 a.	3 m.		3 a.			5 m.						
Foster.	5 m.	2 m.		2 m.	3 m.		3 a.			4 m.						
Glocester.		3 a.		3 a.	3 a.		3 a.			4 m.						
Johnston.		3 a.		3 m.	3 m.		3 a.			5 m.						
Lincoln.		3 a.		4 a.	3 m.		3 a.			6 a.						
North Providence.		3 a.		3 a.	3 m.		3 a.			5 m.						
North Smithfield.		3 a.		3 a.	3 m.		3 a.			5 m.						
Pawtucket.		3 a.		3 a.	3 m.		3 a.			5 m.						
Selma.		5 a.		3 a.	3 a.		3 a.			4 m.						
Smithfield.		1 a.		3 a.	4 m.		3 a.			5 m.						
Woonsocket.		5 s.		4 a.	3 a.		3 a.			4 m.						
Providence City.		5 m.		6 a.	3 a.		3 a.			5 m.						
Charlestown.		5 m.		4 m.	1 m.		3 a.			5 m.						
Exeter.		3 m.		4 m.	3 m.		3 m.			5 m.						
Hopkinton.		3 m.		2 m.	3 m.		3 m.			5 m.						
South Kingstown.		6 a.		5 a.	1 a.		3 m.			1 m.						
Richmond.				5 a.	1 a.		3 m.			1 m.						
Westerly.				5 a.	1 a.		3 m.			1 m.						

\* For explanation see foot note page 157. Small range of temperature during the month.

*Tabulated Summary of Reports of acute diseases prevailing in the several towns during*

DECEMBER, 1879.

TOWNS.	Nasal Pass- age.	Throat.	Bronchial Passages.	Lungs.	Diphtheria.	Scarlet Fever.	Typhoid Fe- ver.	Dysentery and Diarrhea.	Rheumatism.	Measles.	Degree of se- verity.	Brain.	Degree of se- verity.	Hoop- ing Cough.	Degree of se- verity.	Average hu- midity of air.	Aver. Temp- erature.	Fluctuations.
Barrington*.																		
Bristol.	2 a.	2 a.	1 a.	1 a.	4 a.	3 a.			5 m.									
Warren.		2 a.	1 a.	1 a.		4 a.			4 m.									
Coventry.		2 a.	1 m.	3 m.	3 m.	2 a.	1 m.		4 m.									
East Greenwich.		2 a.	1 m.	3 m.					4 m.									
West Greenwich.		2 a.	4 a.	1 s.	4 a.	1 m.			5 m.									
Warwick.	3 m.	2 m.	5 a.	1 s.	4 a.	5 a.			3 m.									
Little Compton.		2 m.	1 a.	2 m.	4 a.													
Middletown.		2 m.	1 a.	2 m.	4 a.	5 a.												
Portsmouth.		2 m.	1 a.	2 m.	4 a.													
Tiverton.	3 a.	1 m.		2 m.	4 a.	5 a.												
Newport City.	3 a.	2 m.	1 a.	3 m.	4 a.	5 a.												
Burrillville.	1 a.	4 a.	2 a.	2 m.	3 a.	1 a.			5 m.									
Cranston.	1 a.	4 a.	5 a.	2 m.	3 a.	1 a.												
Cumberland.		5 a.		2 m.	4 a.	3 a.		3 m.										
East Providence.		2 m.		1 a.	4 a.				4 m.			5 a.		4 a.				
Foster.		1 m.	2 m.	5 m.			3 m.											
Glocester.	2 a.		3 m.	2 m.	3 m.	1 m.												
Johnston.		4 a.	5 a.	2 m.	3 a.	1 a.			6 a.									
Lincoln.		3 m.	4 a.	2 m.	5 a.	6 a.		5 m.						1 a.				
North Providence.	1 a.	4 m.	3 m.	2 m.	5 a.									4 a.				
North Smithfield.		3 m.	5 m.	4 m.	1 m.		3 m.											
Pawtucket.		5 a.		2 m.		1 a.		3 m.										
Scituate.		1 a.	3 a.	2 m.	8 m.			4 m.						4 m.				
Smithfield.		3 m.	4 a.	2 m.	8 m.	7 a.			5 m.					6 m.				
Woonsocket.	1 a.	3 m.	5 m.	2 m.	8 m.	1 m.			5 m.									
Providence City.		7 a.	4 a.	2 a.	3 a.	1 s.												
Charlestown.			5 a.	1 a.	2 m.	3 m.												
Exeter.			3 m.	2 m.	1 m.	1 m.												
Hopkinton.			4 m.	3 m.	4 m.	2 m.		1 a.										
North Kingstown.		3 a.	2 a.	1 a.	4 m.	5 m.												
South Kingstown.			5 m.	4 m.	2 m.	2 m.												
Richmond.		6 a.	4 m.	3 m.	2 m.	3 m.												
Westerly.			5 a.	1 a.	2 a.	3 m.		4 m.						7 a.				

For explanation see foot note page 157. Range of temperature about an average.

It will be seen that the tabulated summaries of the monthly reports do not give the results of observations under all the headings and in all the divisions of the "Return of Diseases." It may be said in regard to that omission, that many of the observations desired of correspondents were for the purpose of private sanitary study and comparison, and had the specific object in view of endeavoring to ascertain what relations existed between certain diseases, not only with each other, but also with the attendant conditions of degree of moisture and warmth, and the conditions and circumstances peculiar to localities. Not having been designed primarily for a public report, they have not been introduced into the tabulated summary of diseases.

It may be observed here, and an examination of the monthly summaries will show, that, taking the record of the year 1879 as the rule, the meteorological conditions of the several towns for the same periods of time are quite uniform throughout the state. And the uniformity having continued so steadily through the twelve months of the year, would seem to settle the question, presumably at least, that such observations made at some central point, or at two or three points, which might cover the possible differences between the conditions of the inland towns and those upon the bay and sea-shore, would answer for all practical purposes for all the towns in the state.

And it should also be further stated, that correspondents have largely neglected to fill the blanks in the "Return of Diseases," which are not introduced into the tabulated monthly summaries, and the result has been that their value for the purpose designed has fallen very short of that which was earnestly hoped and desired. For the reason that a general disposition has been manifested on the part of correspondents to pass over the conditions alluded to in their monthly reports, it will be the intention hereafter to leave such returns out altogether and very probably, from other reasons already stated, the monthly reports may only require an account of the diseases most prevalent.

As the end of the year approached, it seemed quite desirable that a general report, embodying several special features not forming any part of the monthly returns, should be obtained from the several correspondents of the Board.

With that object in view, the following circular, which will sufficiently explain itself, was forwarded to each correspondent.

## (CIRCULAR F.)

## FROM THE OFFICE OF THE STATE BOARD OF HEALTH.

*To the Correspondents of the Board :*

In addition, and supplementary to, the *monthly* returns from correspondents, the Secretary greatly desires a comprehensive report, embodying not only the status of the public health during the year 1879, but also a description of such topographical and industrial features, conditions and circumstances, as appertain to each of the several towns, or smaller areas, and which may possibly or presumably have relation to the production of disease. The following questions and suggestions are offered, as indicating the general plan upon which such report may be based, but subject to such modifications and extensions as each correspondent may deem necessary, to more fully represent the peculiar circumstances of his locality.

The whole or portions of these reports will form a part of the Second Annual Report of the State Board of Health, and will also be kept on file for future reference. They should be sent to the Secretary of the Board as soon after January 1, 1880, as they can be conveniently, and in any case not later than January 31st. If the stamp on the enclosed envelope be insufficient to cover postage on any extended consideration of the topics suggested, or of any questions connected with sanitary science, the additional postage will be immediately refunded on receipt of papers. The reports may be more conveniently divided into classes.

## CLASS I.

1. Name of city or town, and circuit.
2. What has been the proportionate amount of sickness of all kinds in your town or circuit during the year 1879, compared with previous years? Greater, or less? and if either, how much? Approximate estimation.
3. What has been the proportion of deaths from all causes in the same territory compared with previous years? Estimated.
4. What epidemics have prevailed in your section during the year 1879? Name them in their order of occurrence as to dates, if any, and length of continuance; and state the degree of severity, and the localities in which they were prevalent.
5. What endemic diseases, if any, have prevailed in your circuit during the year 1879? and what the localities in which they occurred?
6. What, in your opinion, is the cause, or the several causes, of the endemics mentioned, if any?

7. What diseases not strictly endemic or epidemic, but of more universal occurrence, have prevailed in the course of the year, to an unusually large extent in your circuit?
8. What diseases have been attended with an unusual fatality?
9. Which of the following zymotic diseases, viz: Diphtheria, Typhoid Fever, Hooping Cough, Measles, Scarlet Fever and Small Pox, have not occurred in your circuit during the year?
10. Which of the above named diseases, if any, have occurred sporadically? and what the localities of the occurrence?
11. What circumstances have occurred within your observation or knowledge; that seemed to indicate that Scarlet Fever, Diphtheria or Typhoid Fever had been taken, or communicated from one person to another? A full history of known facts in detail should be given, if any. Such history need not be confined to the year 1879. State on separate sheet.
12. What localities in your circuit do you consider peculiarly unhealthy? giving names and geographical position, and the diseases most prevalent, whether endemic or otherwise, and what you consider the causes of the peculiar unhealthiness.
13. To what extent does Opium or Arsenic eating prevail in your circuit? Please give estimated number of persons using the same, if any are known, and also your opinion in regard to the prevalence of the private use of any other deleterious drug.
14. What is the method of scavenging the streets, and removal of excretæ, and house refuse and garbage in the more densely populated portions of your town? and what the facilities of drainage, natural and artificial of the same?

In addition to Class I, it is quite important that the topography of the towns should be sketched and reported as a means of discovering what connection, if any, certain diseases have with the special natural features, hydrographic and geologic, and especially the constituents and conditions of the surface soil, or deeperearthy strata, and also as a means of ascertaining the probable source of water supply for drinking purposes, which plays so important a part in the production of disease. The following directions will suggest the points and kind of information sought:

## CLASS II.

- A. Describe the streams of water of size sufficient to operate small mills, as well as larger, giving names, length in the town, source, direction, what dams upon them, permanence of size or volume, and variations during the year, with the kind of mills, if any, and number of each for which they furnish power; and into what streams they empty, or where they pass out of the town.
- B. Describe the ranges of hills, with their location in the town; the known or estimated elevation; the direction they run; whether sides are sloping or abrupt; estimated or exact area of each; whether the underlying rock crops out largely over the whole area, or is largely covered with soil; character of surface soil, whether principally sand, gravel or loam, whether retentive of moisture or not; character of sub-soil, whether largely of clay, lime, gravel or otherwise; proportion of woodland and open land, and average condition of vegetation, as to luxuriance of growth.
- C. Describe the location, and give the area, known or estimated, of the swamps, water-soaked boggy land, ponds and reservoirs of ten acres or more: their condition during the latter part of summer, or during a long dearth of rain-fall; their proximity to villages, and names of same. Smaller water pens should be described if they have any peculiarly unsanitary connections, as for instance, if they are the receptacles of drainage from slaughter houses, tan yards, large cattle or hog yards, etc.
- D. Describe the location of all the larger valleys, their direction, area or general width and length, how watered, slope of sides, and character of soil, same as for the hills.
- E. Describe the location of the large plains, and elevated plateaus; their general characteristics of surface and soil, as in the preceding suggestions.
- F. Give the estimated depth of the wells in each of the previously described topographical sections, and especially in the villages, with the probable source of water in the wells of each of the named villages, whether from river, pond, swamp or surface drainage. State also, so far as known, whether water in any given locality is soft, hard, or contains impurities, and kind of impurities, if known.
- G. Describe the geological strata of different sections of the town, if there is any marked variation, giving location, position, extent, dip, direction and character of the underlying rock formations, and such other strata as may be known. This last (Letter G.) of suggested descriptions, while very desirable, is not urged, and is left at the option of the correspondent.

It is hoped that no one of the other descriptions will be neglected, but if correspondents having a large township to describe, cannot go over the whole town in one report, it is suggested that the descriptions be quite thorough of such part as is taken, and the remainder left for another report. Or if the party, to whom this circular is sent, will inform the Secretary what portion of the town he will take, the Secretary will endeavor to find some other intelligent person or persons to take the remainder.

Any one desiring to make a map of his town or circuit, or any smaller locality for approved purposes, will have the assistance of the Board in the execution and defraying of the expenses of the same.

Correspondents will not necessarily follow in detail the order of arrangement presented above, but may choose, each his own method of presentation, only not failing to ascertain and communicate the desired information.

Any one receiving this circular, and feeling disposed to comply with the wishes of the Secretary, in reporting upon either or both of the classes named, will be supplied with stamped envelope for the same, by giving name and P. O. address upon the accompanying postal card, and return by mail.

Replies to questions under Class I, may be given in the spaces between the same, when affording sufficient room, otherwise on a separate sheet prefaced by a number corresponding to the number of the question.

CHAS. H. FISHER,

Dec. 13, 1879.

*Sec. of the Board.*

#### REPLIES TO CIRCULAR F.

The following reports from the several cities, towns and villages of the state, will give a good representation of the general status of the public health for 1879, the presence or absence of epidemics and endemics in the several locations, and also remarks upon various topics of interest to every citizen having the welfare of the communities of the state at heart.

#### WARREN AND EASTERN PART OF BARRINGTON.

1. Proportionate amount of sickness less than in ordinary years.
4. No general epidemics have prevailed.
5. Catarrhal Tonsillitis and Follicular Pharyngitis have seemed to have been endemic.



6. The causes are believed to be filth, poor drainage, and bad ventilation of the packed tenements, in the locality where they occurred.
8. Pneumonia has been attended with unusual fatality.
9. Hooping Cough, Measles and Small Pox have not prevailed. Diphtheria and Scarlet Fever in small extent.
10. Typhoid Fever has prevailed more largely in North Warren, which is proverbially unhealthy, and all zymotic diseases have larger prevalence there than elsewhere in the town.
13. A few Opium eaters. None of Arsenic.
14. Surface drainage by gutters. The main streets are well cared for. Elsewhere in the town, scavenging is not looked after very attentively.

G. L. CHURCH.

ANSWER TO QUESTION 11, CLASS I.

There occurred in the family of Henry Manchester, about three years since, the following cases of Typhoid Fever, viz: A son-in-law of H. M. was sick and died in Providence, and was attended by the wife of Henry Manchester. She returned to Warren, and in about seven days was taken with the same disease, and died a few days after. Then in about the average period of time for contagious diseases to be developed, a son of H. M. was sick of the same disease, and died after about the same period of sickness. Then in about the same length of time, another son was attacked and died of the same disease. The three persons named were in good health previous to this fatal sickness.

I had a similar experience with the contagion with Diphtheria in my own family, about two years since. My daughter-in-law had the disease lightly, and communicated it to her son, about eighteen months old, who died. The child gave it to his father, who had the disease quite severely, but recovered. One son about three years old, who was kept separate from the family, escaped the disease.

OBADIAH CHACE.

IN REPLY TO NO. 11.

I have known Scarlet Fever to be communicated from one person to another. Some years since, a nurse in my circuit went into the country to take the care of a person sick with Scarlet Fever; the patient died in a week or so. The nurse came back to her home, which was in the chambers of a house in this town. A little girl, living below stairs in the same house, went up stairs, and sat in the lap of the nurse most of the evening after she came home. In two or three days the little girl came down with Scarlet Fever, and died in one week. No other cases in town.

Several years since, the Scarlet Fever prevailed quite extensively in Bristol, four miles from this town. Quite a number died from the disease. A man in my circuit, living in Barrington, was at Bristol at work; took the disease from one of the boarders, and came home. He held his little girl, three or four

years old, in his lap nearly all of the first evening. She took the Scarlet Fever and died in a week. The Scarlet Fever was not and did not prevail in Barrington in that year.

It seems to me that these cases were communicated from person to person.

OTIS BULLOCK.

IN REPLY TO NO. 11.

A servant, aged eighteen, employed in family, where a year and a half ago, a fatal case of Scarlet Fever had occurred, was directed to renovate the room where the patient had remained during the fever, the room having remained nearly untouched since. She removed and shook carpets, cleansed the room and thoroughly overhauled it. Within two weeks she was attacked with the fever. She passed through safely the general course of the fever. Symptoms prominent and desquamation general over the whole surface; recovered.

Two years ago, we had an epidemic of Scarlet Fever, commencing with severe types and attended by many deaths. In one family, four children in north part of town (Warren Manufacturing Co.'s land) and two in another; proved fatal, while a large number of families lost one member.

I think that here the spread was infectious rather than contagious, as cases cropped up very remote from each other, and no immediate communication being known, or at least, in general. Reports are circulated at present of cases here and there, without much foundation. By inquiry, they generally are found to be Follicular Pharyngitis or Tonsillitis of a peculiar character. C.

COVENTRY.—CIRCUIT: COVENTRY, SOUTH FOSTER, AND WEST GREENWICH.

2. The proportionate amount of sickness of all kinds during the year 1879, has been greater by about one-eighth.
3. The proportion of deaths from all causes in the same territory, compared with previous years, has been less, if anything.
4. Rheumatism, Acute, Articular, throughout the year; and during summer especially Bilious Fevers, Slow. The former on low lands, and the latter on high land among farmers mostly, and often very *obstinate cases*.
5. Asthma and Typhoid Dysentery, have seemed endemic. Asthma chiefly on high land, in farming districts. Typho-Dysentery on flats and in villages where lodgings were unventilated and water bad.
7. Rheumatism and Bilious Fevers, have prevailed more extensively than usual.
8. A large percentage from Scarlet fever, (and old age).
9. Small Pox; have not had a single case.
10. Diphtheria, Typhoid Fever and Scarlet Fever, have occurred sporadically, in various sections of the town.

11. Last March I attended five cases of Scarlet Fever in one house; two cases of malignant form. The house was soon vacated and another family took possession. Six months later I attended two cases of Scarlet fever in same house, one quite severe. History was: the children had seen no strangers; had not been away from home; but two (2) weeks before, found some old paper, rags, etc., which the other family left in a small room. They played with the same several hours, and, and in my opininn took the Scarlet Fever from those old clothes and rags.
12. Coventry Centre, and immediate vicinity, I consider very unhealthful. Situate on low land and surrounded by shallow ponds and newly made reservoirs. Most prevalent disease at all seasons in 1879, Diphtheria and Typhoid Fever.  
F. B. SMITH.
13. Opium eaters (consumers), five in number.
14. Drainage very good where needed. This is in the main a farming community.

EAST GREENWICH AND PARTS OF WARWICK AND NORTH KINGSTOWN.

2. The proportionate amount of sickness of all kinds during the year 1879, compared with previous years, has been about an average, but below rather than above.
3. The proportion of deaths from all causes in the same territory, compared with previous years, has been slightly below the average.
4. The following epidemics have prevailed during the year 1879: Catarrhal Influenza in the first quarter; Rheumatism and Pneumonia in latter part of winter and spring—not very severe; Whooping Cough [in summer and fall; Typhoid Fever late summer and fall; Scarlet Fever and Mumps fall and winter; some Diphtheria in December.
5. No endemics proper. Rheumatism, Pneumonia and Typhoid Fever—attributed to the season, the weather, and in the last named, to some faulty drainage or impurity of drinking water in localities.
6. As stated above, but not certainly known.
7. The diseases not strictly endemic or epidemic, which have prevailed in the course of the year, to an unusually large extent in this circuit are Mumps, Whooping Cough and Typhoid Fever.
8. The diseases attended with an unusual fatality have been organic diseases of the heart in Syncope—dying suddenly.
9. No Small-Pox or Measles.
10. No zymotic diseases have occurred sporadically not traceable to some source of infection.
12. There are no localities in this vicinity which can be considered peculiarly unhealthy. There is more sickness proportionally among the factory villages, and we attribute this to the occupation and mode of living, rather than to natural features of locality.

13. Some cases are known where morphine is used habitually in great quantity—*say 1 ounce per week*—but not many and no other drug than opium and its preparations.

14. The methods of scavenging the streets, and removal of excretæ, and house refuse and garbage are no other than surface drainage, and offal removed by carts from gutters and privy-vaults—not regularly; vaults and cess-pools not made tight; natural drainage very good.

J. H. ELDRIDGE.

#### TOPOGRAPHY.

##### (A.)

East Greenwich and parts of Warwick and North Kingstown adjoining are watered by two streams—Mascachug and Green's or Hunt's River.

The first rising from three sources in that part of Warwick know as Cowesett, which run in a southerly or southeasterly direction, unite and empty into Greenwich Cove at Mascachug. On this stream are two dams for reservoirs for a print works. There are no extensive marshes or swamps, and the brooks and ponds are often nearly dry in the late summer and fall.

The second is a larger stream, rising in that part of North Kingstown called Scrabbletown, and in that part of East Greenwich called Frenchtown, from many sources which unite at Davisville, and running easterly, empty in Narragansett Bay at Greene's Cove or Potowomut. On this river and its branches are many dams and ponds for mill purposes. At Davisville, is a large marshy pond of many acres, and another at Potowomut Factory less marshy and not so large. This river is never dry, and is not so liable to sudden freshets as the first. The mills upon the smaller branches are saw and grist mills; at Davisville a woolen mill and at Potowomut a cotton mill.

##### (B.)

East Greenwich and the adjacent parts of Warwick and North Kingstown are bounded on the east by waters of Narragansett Bay. At the village and for two miles and a half to the north, in the borders of Warwick the land rises somewhat abruptly from the water, until it reaches at a distance of half a mile from the shore, an elevation of one hundred and fifty to two hundred feet. This ridge runs north and south from the Drum Rock on the north, above the village of Apponaug, to the cliffs half a mile west of Greenwich. Near the shore the soil is sandy; on the ridge gravelly, with rock and loose stone, and the western slope of this ridge is very much covered with wood and brush, cedar predominating. Potowomut, lying between Greenwich Cove and Greene's River, about two thousand acres in extent, with a sandy soil and smooth surface, with a general elevation of about thirty feet above high water.

That part of North Kingstown lying south of Green's River and on the bay is known as Quidnesset, having a rougher surface; a clayey soil, with much rock and loose stone and wood and brush.

##### (C.)

The only extensive bog or swamp within the district, is the pond, so called, at

Davis' Mills. This is some one hundred acres in extent, and portions of it so drained in latter part of the summer, as to be mown.

There are no unsanitary connections with this bog, except the swarms of mosquitos which infest the neighborhood and which are bred in this marsh.

(D.)

The valleys are not extensive—merely the water courses of small streams which intersect the country as you go in a westerly course; alternate ridge and valley, not alluvial bottoms, but bushy, swampy ravines.

(E.)

The only plains of any considerable extent are Potowomut and that part of Quidnesset lying near the shore, and not more than twenty-five or thirty feet above the surface of tide water. The soil is sandy, gravelly sub-soil.

(F.)

The average depth of the wells in the village of East Greenwich, where permanent supply of water has been reached, is about twenty-five (25) feet.

The springs which supply these wells come through seams in the rock which lie about fifteen feet below the surface, dipping toward the northeast at an angle of about 25° and intersected with open seams running in the course of the ledge, and with cross-seams at right-angles.

All springs above the rock are soon dried up. The water, when uncontaminated, is pure and soft and good for all purposes. Many wells have been found, on examination, to be contaminated. The water holding much organic matter in solution, not always apparent to the senses, and only detected by chemical examination. Many wells not carefully examined, and supposed to be good, are very probably badly contaminated by surface drainage. The drainage of the impurity being privy vaults and cess-pools which are purposely made open so that the water may drain off. The rock lying so near the surface and intersected as it is with seams, affords an easy means of conveyance from these reservoirs of filth.

These remarks apply to the wells in the village of East Greenwich especially. The wells in the remoter part of the town and vicinity present nothing peculiar.

J. H. E.

BURRILLVILLE.

In making a return for the past year (1879) for this locality, I can say, we have been remarkably free from epidemics of all kinds until about the first of November, when an epidemic of Hooping Cough broke out with considerable severity, causing several deaths among children under one year of age, and the cough, in some cases of older children, still continues. During the months of August, September and October, even into December, there were isolated cases of Typhoid Fever, showing a slight tendency to ulcerations about the throat (perhaps Diphtheritic), severe enough to cause some slight bleeding from pharynx. Some of these cases occurred in isolated localities where the drainage was exceptionally good, being on a high hill which sloped in all directions away from the house. In

this place, eight persons in one family were sick at one time; the father, aged about seventy-five years, and seven children, ages varying from seven to twenty years; all surviving, but making a slow recovery; two having bed-sores; another, partial loss of use of the lower limbs, which gradually subsided. It could not be traced to lack of ventilation, as the house was old, and the wind had free passage through the cracks, especially in the upper part of the house, which was unfinished and occupied by the children as sleeping apartments.

There have been no other cases of interest occurring in my locality.

H. J. BRUCE.

VALLEY FALLS, PARTS OF CUMBERLAND, LINCOLN AND PAWTUCKET.

2. The amount of general sickness during 1879 was less by one-sixth than the previous year.
3. The proportion of deaths very nearly the same.
4. A mild epidemic of diarrhæa in October. unusual from the lateness of the season, presumably caused by atmospheric changes.. Also an epidemic of Hooping Cough, continuing through the fall months.
5. No endemic diseases.
7. No disease has assumed special prominence, either by its extent or severity.
8. No diseases attended with unusual fatality.
9. No cases of Small Pox.
10. Diphtheria, Typhoid Fever, Measles and Scarlet Fever have occurred to a limited extent, scattered indiscriminately through the communities.
11. In three instances two members of the same family have had Scarlet Fever. Two of these families sent the children to the same Kindergarten school. One child in each family came down with the disease within a week of the other, and was followed in about ten days by a younger child, who did not attend the school. There was no known instance of exposure to the disease in the first cases, nor did other members of the school contract the disease. In the other cases, four or five in number, there was no evidence to ascribe it to contagion. It would seem that the evidence in all these cases is of a rather negative character. Among the cases of Typhoid Fever there is no reason whatever to ascribe them to contagion. One case, and one only, occurred in a large factory boarding-house. All the cases were remote from each other.
12. The village of Valley Falls is exceptionally healthy, and no part of it noted for disease or mortality.
13. Only three or four persons are known to me to be habitual Opium eaters, and only one is suspected of eating Arsenic. The use of snuff, either by "dipping," or "rushing," is in quite extensive use among the female factory operatives. I have no knowledge of the private use of any other drug.

14. The streets in Valley Falls are provided with open paved gutters, which carry of the surface water, together with excreta, the detritus of the street, and refuse matter. Whatever accumulates in the gutters is removed in carts fall and spring. The contents of privy-vaults and cess-pools are removed in close carts, and whatever is valuable is utilized for fertilizing purposes. Most of the streets are graded in such a manner as to carry off the surface water, and obviate the dangers of stagnant pools.

G. B. HAINES.

#### TOPOGRAPHY.

##### (A.)

The Blackstone river passes through the western part of the village, running in a southeasterly course, and for about six miles forming the boundary of the towns of Cumberland and Lincoln. On this river, within the towns of Cumberland and Lincoln, are situated the mills of the Manville Company, Albion Company, Ashton Company, Lonsdale Company and Valley Falls Company, and near it the Berkeley Company, all engaged in the manufacture of cotton goods. These are all extensive works, and too well known to require any description. The volume of water is sufficient to furnish them power. The flow of water during droughts is very small, and is largely held back during a free flow in the reservoirs above the several dams. The water is of inferior purity, due to the large number of manufacturing establishments situated on its banks.

The Abbott Run river passes through the easterly part of Valley Falls village, and empties into the Blackstone. On this stream are a number of cotton factories of less extent. The volume of water varies greatly at different seasons of the year. Often the water in the summer is insufficient to carry the machinery of the mills. The water in this stream is of exceptional purity, and has been utilized by the town of Pawtucket as a source of water supply.

Carpenter's pond, of only about an acre in extent, is situated also in the easterly part of Cumberland and the westerly part of Attleboro'. A small stream flows from this pond into the Blackstone river.

##### (B.)

The larger part of the town of Cumberland is comprised in the territory lying between the Abbott Run river on the east and the Blackstone on the west. This is composed of a swell of land somewhat undulating and irregular, and rising at its highest elevation to a hundred and fifty or two hundred feet. It is no where precipitous. It is chiefly devoted to agriculture and grazing, and is of a fair degree of fertility. The forest trees are found on only a small proportion of the land—not more than an eighth, and they are fast disappearing. The underlying rock rarely crops out. Large boulders are found scattered over a great extent of the more elevated parts. The sub-soil is gravelly and porous.

##### (C.)

There are perhaps two or three hundred acres of low land on the borders of the Blackstone river. In the spring, during high water, these lands are submerged, but admit of cultivation during the summer. These lands are situated

from half a mile to two miles above the village of Valley Falls. The low lands on the Abbott Run river are very limited in extent. There are no stagnant pools of filthy water.

(D.)

The valleys follow the course of the streams. They are of small extent and usually cultivated.

(E.)

There are no large plains near this vicinity.

(F.)

The village is supplied with water for culinary and drinking purposes by wells, and for other purposes by cisterns. The wells vary in depth from twenty-five to eighty feet. The water probably filters into the wells from the surface. It is universally of good quality and very palatable. It contains very little organic or mineral impurities. It is not, however, so well adapted for washing and laundry purposes as cistern water.

(G.)

The only geological feature peculiar to this locality is an extensive underlying coal formation. This crops out in a few places. Several attempts have been made to mine it, but the quality of the coal is so poor as to prove worthless for fuel. The Blackstone Coal Mining Company are now engaged in mining it, to be used for foundry facing, for which purpose it is well adapted. It is prepared by drying it, and then grinding and bolting it.

There is one other subject that *may* have some sanitary value. I refer to the railroad facilities that this place enjoys. The Providence and Worcester Railroad passes through this village, forming a junction with the Massachusetts and Rhode Island Railroad. The India Point branch also terminates here—devoted exclusively to freight. On the Providence and Worcester road this is the terminus of the hourly train from Providence. By the roads easy and frequent communication is had with Providence, Worcester, Boston and intermediate stations. The repair shops of the P. & W. R. R. are soon to be established here.

Here also are located the extensive works of the Rhode Island Horse Shoe Company, thus giving to the village a varied industry, and helping to impart to it elements of a good sanitary character.

G. B. H.

FOSTER.

2. About the usual amount of general sickness.
3. Proportion of deaths rather large.
4. No epidemics, strictly speaking. Pneumonia and inflammations of the throat and air passages, prevailed largely in latter part of winter and spring. Typhoid Fever in the fall months rather severe. Other diseases about as usual.



5. No endemic diseases known to prevail in any locality in this town.
9. No Small Pox.
10. Diphtheria, Typhoid Fever, Measles, Scarlet Fever and bowel diseases generally, have occurred sporadically. Impure water believed to be the cause, or at least an aggravation of many cases of disease.
12. No localities peculiarly unhealthy.
13. But few Opium eaters. None of Arsenic known.

M. P. ARNOLD.

#### TOPOGRAPHY.

*Rivers.*—Ponaganset, largest; course southerly and easterly into Scituate. Hemlock the largest branch; Moosup, course southerly into Coventry. In the north part of the town the small streams empty into the Chestnut Hill ponds or reservoirs in Connecticut. Small streams empty into the Clayville reservoir, or Westcanaug reservoir in the southwest part of the town. Flat river, from the southeast limits of the town, runs into Coventry southerly for the Quidnic river. The hills and valleys follow the course of the rivers. Swamps small. Ponaganset valley large. Hills highest in the north part of the town; in some places abrupt, mostly sloping; granite crops out in various places, in the small hills. Among the rivulets of the Moosup, iron ore rock crops out, mostly, however, covered with granite. In the westerly, and north of the centre, bog iron ore is found. The table land, good grain land—some good alluvial soil, some not so good, but dry and generally quite smooth, having underneath gravel or clay. Hills, deep soil—rough, moist—hard-pan underneath. Good grazing and grass land. The hills are covered with forest trees to some extent. But little timber land in the central and south part. Wells from ten to forty-two feet deep, according to location, mostly soft and good water.

The height of the hills at the north part of the town, I should think was 500 feet above tide-water.

This town I consider very healthy.

The native rocks are mostly if not all, in layers; dip northerly; some dark from mica slate; others light colored. Some very large boulders, and small ones plenty enough.

M. P. A.

#### GLOCESTER.

2. The proportionate amount of sickness of all kinds in this town during the year 1879, compared with previous years, has been 25 per cent. less.
3. The proportion of deaths, from all causes, in the same territory, 25 per cent. less.
4. No epidemics have prevailed during the year 1879.
5. The only endemic disease that has occurred in this circuit during the year 1879, was Typhoid Fever, in a farm house in the country. Soil sandy; house medium height; surroundings average.

6. The cause or the several causes, probably overcrowding and want of good ventilation. Water apparently good.
  7. No diseases have prevailed during the year, to an unusually large extent.
  8. No diseases have been attended with an unusual fatality.
  9. The following zymotic diseases, viz.: Diphtheria, Hooping Cough, Measles, Scarlet Fever, and Small Pox, have not occurred in this circuit during the year.
  13. Two cases only known in town of Opium eating. Dipping snuff, rather prevalent among female operatives.
  14. The method of removal of excretæ, and house refuse, is by privy vaults and cess-pools, which are emptied by mixing with earth and removed in open carts by the owners.
- A. POTTER.

JOHNSTON, WITH PARTS OF CRANSTON AND NORTH PROVIDENCE.

2. The proportionate amount of sickness of all kinds, in the southeasterly half of the town during the year 1879, compared with previous years, has been larger—10 per cent more sickness than 1878.
  3. The proportion of deaths from all causes in the same territory, compared with previous years, has been 2 per cent. more.
  4. The following epidemics have prevailed during the year 1879: Pertussis, March to July, moderate in severity; Scarlet Fever, August to December 31st, quite severe; Diphtheria, October to December 31st, mild; Measles.
  5. The following diseases have seemed to have been endemic: Tonsillitis, Dyer's district—poor water; Typhoid Fever, Riverside district and Merino.
  6. Cause, poor water and imperfect drainage, in part.
  7. Pneumonia, Influenza and Bronchitis have prevailed to an unusual extent.
  8. Pneumonia has been attended with an unusual fatality.
  9. No cases of Small Pox.
  12. In the locality of Riverside mills, and tenements belonging to the same, there has been considerable sickness, from impure water. Its location, in some parts is on very low land, and numerous cess-pools are exposed. The town has been notified, and some measures have been taken to abate the trouble. More attention will be necessary.
  13. Quite common to find Opium eaters. Fifteen Opium and Morphine eaters known. Three Arsenic.
  14. Streets are cleaned by hoe and shovel, about once a month. Where there are sewer pipes, fair drainage, although Olneyville square is often flooded on account of too small sewer pipes. Some localities have cess-pools covered, and a few privies uncovered. Town authorities are attending to latter.
- G. R. FISHER.

## LINCOLN AND CUMBERLAND.

1. Lonsdale, including a territory about four miles square, whose *centre* would be north and west from the village.
2. The proportionate amount of sickness of all kinds in this circuit during the year 1879, compared with previous years, is about an average.
3. The proportion of deaths from all causes in the same territory, compared with previous years, is probably twenty-five per cent. greater.
4. The epidemics that have prevailed in this section during the year 1879 are:
  1. Pertussis began in summer and is now rife in Berkeley and Ashton.
  2. Parotitis in Berkeley and Ashton; ravaged Lonsdale the year before.
  3. Varicella, now in Berkeley and Ashton; some severe cases.
  4. Diphtheria, at Scott's Pond, a small village on the Moshassuck.
5. Diphtheria would more properly occur here. Although Scott's Pond (otherwise Sayles' Bleachery) is a comparatively small place, more cases and more deaths have taken place there than in all the rest of my circuit. It may contain 1-10 of the population.
7. No diseases, not endemic or epidemic, have prevailed in the course of the year to an unusually large extent in this circuit.
8. An unusual number of sudden deaths (before arrival of physician) have occurred, *e. g.* four of adults in November and December.
9. The following zymotic diseases: Typhoid Fever and Small Pox, have not occurred in this circuit during the year.
10. There have occurred sporadically, Scarlatina—perhaps a dozen cases. Measles, early in the year, a less number.
12. The following locality in this circuit I consider peculiarly unhealthy: The stone blocks in the old village of Lonsdale—long buildings running east and west, with privies in the damp, shaded yard between, occupied by a great many persons,—forty-six families, besides a three-story boarding house also full. Drainage bad.
13. I *know* of but two cases of confirmed opium eating in adults. Infants and young children become addicted to the habit through the administration of "soothing syrup," &c. I have never known a case of arsenic eating here.
14. Cess-pools and privies are emptied almost continually by carts, one or more of them being uncovered all the time. Disinfectants are used but not thoroughly. In very few houses are the sinks trapped.

L. F. C. GARVIN.

## WOONSOCKET.

2. The proportionate amount of sickness of all kinds during the year 1879, has been slightly less.

3. The proportion of deaths from all causes in the same territory, about as usual.
4. No disease has been epidemic.
5. No endemic diseases have prevailed in this circuit during the year 1879, within my personal knowledge. I have heard of some Typhoid Fever among the Canadian French, though not very numerous. There have been scattered cases of Scarlet Fever, of mild type. Very little Diphtheria.
7. No diseases have prevailed in the course of the year, to an unusually large extent. But nearly all the ordinary diseases have occurred sporadically.
8. Pneumonia has been rather more fatal than usual.
9. Small-Pox has not appeared.
12. Some of the low parts of the compact portion of the town, along the river courses, where heavy fogs prevail in spring and fall, giving rise to lung troubles and rheumatism, are the most unhealthy localities of this section.
13. Opium or Arsenic eating does not prevail in this circuit very extensively within my personal knowledge; perhaps I know of ten Opium eaters. Snuff dipping or eating is quite common among the French female mill operatives.
14. The method of scavenging the streets in the populated portions of the town is by removal by town teams. Surface drainage in cases not provided as above; no public system in use, though natural conformation of land and location of streams offer good advantages for such.

G. W. JENCKES.

CITY OF PROVIDENCE.

2. The proportionate amount of sickness of all kinds in this city during the entire year 1879, as compared with previous years, was about an average. During the first six months, although pneumonia was quite prevalent in January, the amount was somewhat less than the average for the same season; during the third quarter, considerably less than the average for that season; but during the last quarter, the general sickness was considerably larger than the average.
3. The proportion of deaths to whole number of cases of sickness, is also believed to be about the same, as in the average of previous years.
4. With the exception of Scarlet Fever, it can hardly be said that any epidemic has largely prevailed in the city. Diphtheria has been present during the entire year, but the number of cases has been less than that of several other diseases. Scarlatina has prevailed throughout the year; was one of the leading diseases during the first quarter, the cases diminishing in number until in July and August they almost disappeared, but as the

cooler weather approached, the numbers increased, until in October the disease assumed the proportions of a fearful epidemic.

5. No locality is known which conspicuously harbors or promotes any special disease.
7. Pneumonia and Bronchitis prevailed to an unusually large extent, in the earlier months of the year; Scarlet Fever, as above stated, in the last quarter, and diseases of the heart, throughout the year.
8. The diseases attended with unusual fatality in proportion to numbers, were Pneumonia, Bronchitis, and acute diseases of the heart. Scarlet Fever was not attended with an unusually large percentage of deaths, according to the opinion of a number of physicians.
9. Small-pox has not occurred during the year.
13. The consumption of Opium by private use prevails to a considerably large extent in the city, but how many in number are private consumers is simply conjectural. Arsenic is believed to be used privately to some extent; and Tobacco has an enormous consumption in many varieties of form.

The following communication may be considered under question 11.

*To the State Board of Health:*

GENTLEMEN:—Permit me to direct your attention to the following facts concerning an interesting group of cases recently attended by myself.

On March 25th 1879, medical advice was sought for Mabel M., aged 6½ years, and residing on the second floor of 10 Western street, second house from that on southwest corner of Jenkins and Western. She was suffering from Diptheritic Croup; the laryngeal symptoms had drawn the attention of her parents to the tonsillar. Next day, Susie C., aged 16 years, required treatment for some neuralgic trouble. She was confined to her bed in the room directly under that occupied by Mabel M. At the same time, attention was directed to the swollen face of Emma C., aged 13 years. As Mumps had recently prevailed in the neighborhood, no suspicion had been excited, but examination revealed the dreaded membrane. Her system was comparatively unaffected for she remained active throughout the attack. Since commencing this report, I have learned that she was rooming at the time with Susie.

On the 30th, the latter manifested the ordinary Diptheritic symptoms; also a sister, Marion, aged 6½ years. For convenience, she was removed to Susie's room, but after two days, the severity of her attack necessitated a second change, though only to an adjoining apartment. On April 2d, Georgie M. aged 4 years, took his place in the invalid corps, but was dismissed as convalescent one week later. Mabel M. escaped from medical supervision on the 8th. On the 11th Minnie C., aged 4½ years was added to the sick list, but Susie and Marion were stricken off next day, the latter only to be replaced on the 14th, for treatment of sequelæ. On the 17th, Fred C., aged 18½ years, followed the example of his sisters, but he required attention only five days. On May 5th, Bertha M., aged 1½

years, fell moderately ill. Croupy manifestations occurred two or three days later. I left the city Saturday evening, 10th, for the purpose of securing an entire day's rest, the little prattling seeming better conditioned than her sister Mabel had been most of the time. About noon of the 12th, I found her exhibiting the symptoms of the last stages of Membraneous Croup, and was informed the change took place about six o'clock the evening previous. Tracheotomy was suggested as the only possible relief, but the idea proved so repugnant, it was not urged. Death occurred twenty-six hours later.

Meanwhile, March 29th, Mr. K., aged 28 years, and residing on the first floor of 48 Jenkins street, northeast corner of Western, fell sick and received attention until April 8th. He was not permitted to resume the duties of his vocation, however, until five days later. His wife, aged 25, required attendance from the 21st to the 23d of April, inclusive. Finally, April 22d, Ella A., aged 24 years and residing on the first floor of 42 Jenkins street, sought medical care which was continued some five days.

The above cases are related as follows: On the 1st and 5th of March last, Dr. H. lost by Diphtheria, two young children who resided on the lower floor of 38 Jenkins street, northeast corner of Padelford. The oldest and only surviving child was first taken ill. *It is said* the others contracted the disease by stealthily seizing and using an orange that had first been sucked by the sick one. The attending physician rendered every attention that culture, devotion, and the experience of eminent counsel could suggest; but conditions dependant on the social position of the family, aggravated manifold by the idiosyncracies of a widowed mother, and a specific taint in at least one of the children, overcame all the resources of professional skill.

Mrs. C., of 10 Western street, pitied the forlorn family, and, while other neighbors studiously avoided the house, devoted all her spare time to nursing the sick children. Mabel M. was very intimate with the C.s, being down stairs quite a large part of the day. Mrs. K.'s mother, residing in her family, is a distant connection of the bereaved widow. She called two or three times a week, but never tarried long for fear of taking or communicating the disease. Mrs. A. visited the house only two or three times in all, but she remained longer.

It should be stated, parenthetically that Mrs. M., aged 28, suffered from a slight attack at the very end of December, 1878, and Georgie M., early in January, 1879; also, that a boy about seven years of age, died from this cause in November, 1877, on the second floor of 48 Jenkins street.

Concerning the sanitary condition of the homes above referred to: I found nothing at 42 or 48 Jenkins street, deserving special criticism; 10 Western street, is in my opinion, unsuited for habitation until important alterations have been made in the house and its surroundings, more especially as regards cess-pool and vault. The street is ungraded, and hence moderately uncleanly. It is always damp—generally muddy. The street water, by some means, penetrates into the cellar of this house, one-half of the basement only being cemented. The walls of this portion are frequently *very* moist. During the past season everything has been afloat upon the other side. As the water soaked gradually into the ground it may be imagined the debris did not exhale the most savory perfumes. At one time the sink water backed into the finished basement; its final disposition is the privy vault, whence rise extremely disgusting odors. Moreover, one corner of the

yard formerly bordered a marsh extending to the south and west. Traces thereof require to be eradicated. Dr. H. informed me that 38 Jenkins street was in fair condition; but from other sources I learn it is very damp, and I know the family was not particularly neat. A neighbor's yard, closely approximated, may, however, *well* be considered a rich spring for "filth disease."

Mention may here be made of Mrs. H., aged 39, and residing at 30 Mulberry, corner of Orms street, who was found seriously ill on April 8th. She had bestowed considerable attention on a child who died from this disease next door, the day previous. Also, that on September 27, 1877, I lost a young miss aged 12 years from the same cause, who resided on Congdon street, north of Jenckes, the third house, west side. Others of the children were sick about that time. In the house at the northeast corner of these two streets, there had been a number of cases of extreme severity. The premises were remarkably filthy, indoors and out. That portion of Congdon street is ungraded, and frequently is the receptacle of all manner of refuse. About that time this disease was to be found in nearly every house. The young people had been playmates.

The only general "disinfectant" employed was chloride of lime.

To avert the charge of prejudiced observation, I will remark that I do not believe Diphtheria is contagious, and I never conceal my opinion; that I am ignorant of the origination of this disease, and I never met a gentleman who could inform me; also that "Diphtheritic Sore Throat," bears the same relation to Diphtheria, that Scarlatina Benigna does to Scarlatina Maligna.

Very respectfully yours,

GEO. B. PECK, JR.

#### JAMESTOWN.

Mr. J. B. Briggs writes from Jamestown as follows:

"All parts of the town healthy through the year; do not know of but one death in 1879; man past middle age.

Know of but one person using Opium constantly.

Consider Jamestown one of the most healthy places. Drainage natural; island high in the centre; has but one swamp of any consequence; some rocky hills at south end; is strictly a farming town; is about nine miles long by an average of one mile wide; town includes Dutch Island and Gold Island.

Have lived on the island nine years; but few deaths of children in that time, and seventeen deaths of adults, as follows: One 94 years of age; four rising 80 years; six past 70 years, four past 60, and three past 50 years of age."

#### PORTSMOUTH AND MIDDLETOWN.

2. Amount of general sickness for 1879, about an average with previous years.
3. Proportion of deaths rather larger.
4. In the winter and spring, large numbers were affected with catarrhal influenza.

5. No strictly endemic disease has prevailed in any district during 1879. In previous years, there has seemed to be a much more than usual tendency toward tetanus, both traumatic and idiopathic, in the vicinity of Stone Bridge, so much so as to suggest some endemic influence, not known.
7. No general disease has prevailed to an unusual extent, unless diabetes in Middletown be an exception.
8. No diseases attended with unusual fatality.
9. Diphtheria, Measles and Small-Pox absent in 1879.
10. Scarlet Fever has prevailed sporadically in Portsmouth, and Typhoid Fever in Middletown.
12. The localities peculiarly unhealthy are at the coal mines, near the north end of the island, and on the west shore, and a point nearly opposite on the east shore, in the vicinity of Newtown. The former is made up of an Irish mining population almost entirely, and the latter of an American fishing population. Each location has a river on one side, and low, wet land dividing them from the rest of the island on the other.
13. I know of but two or three who are addicted to the use of Opium.
14. There are no artificial means employed for drainage, or for the removal of excretæ and garbage, other than is ordinarily used in country localities.

## LITTLE COMPTON.

2. General amount of sickness for the year, about an average.
3. Proportion of deaths, about an average.
4. No epidemic prevalent during the year.
5. Dysentery and Typhoid Fever have seemed to be endemic, and, perhaps, Erysipelas and Diphtheritic Sore Throat.
6. Know of no cause, except impure water used for drinking.
7. The following diseases have prevailed more largely than usual: Hooping Cough, Diphtheritic Sore Throat, Tonsillitis and Typhoid Pneumonia.
8. No unusual fatality.
9. No zymotic disease prevalent, except Typhoid Fever, and other diseases of intestines.
10. A few cases of Hooping Cough.
12. Doubtless the swampy lands, if the season is very wet, or very dry, are more unhealthy than other localities. There is a large proportion of swampy lands in the town.
13. Only one person known who uses Opium.

## IN REPLY TO NO. 11.

Was called to attend a case of simple fever, as thought, from what the father



told me. I went and found two daughters sick, one at the point of death, the other very low. They had been attended by a physician not belonging in town, who pronounced the cases simple Fever. I immediately pronounced the cases the worst type of Typhoid Fever. In twenty-four hours the first case was dead. In twenty-one days, a family consisting of father, mother, son and four daughters were down with the fever; the son died, the father died, and the daughter before mentioned. I called in the assistance of the late lamented Samuel West, M. D., and both of us spared no pains to put the household on strict quarantine regulations, and I tested the water of the well and of the cistern; made a survey of the cellars of the house, and of the surrounding grounds, but found nothing to lead me to believe that it was local. On strict inquiry, I learned that a Portuguese traveller had been taken sick in the house, with what they thought nothing but a cold. He soon left, and finally went, as near as I could learn, to the Massachusetts General Hospital, where he had genuine Typhoid Fever, and died. This Portuguese was just landed and came right there from a Portuguese boarding-house, and was feeling this cold (as they thought) when he arrived at the house. His bed-clothes, after he left, of course, mingled with the others. No care was taken, as they knew not the danger. After weighing the case in all its details, I came to the earnest conviction that Typhoid Fever is contagious; one fact making my belief more strong, that an aunt who was with me to assist, also came down with the fever, but recovered. Other families have lived in the house since, but never a case of Fever since those.

I. B. COWEN.

#### TOPOGRAPHY.

##### (A.)

We have only one mill operated by water, and that from a pond fed by small streams from swamps, said streams running north and south. All of our brooks or small streams run in a southerly direction, and are dry, or nearly so, in the summer months. Those ponds or streams finally enter the ocean by creeks. All our largest ponds are near the beach, and only divided from the salt water by a line of gravel. We have no elevated hills, to any extent; their sides are sloping, and in the valley is found a swamp, with a brook running through it. One-half our surface is swampy land, the rest of a very heavy loam.

I don't think the wells average over seventeen feet in depth. In many instances, cess-pools and privies are very near the well, and have ordered several removed to a further distance. Our ranges of hills are north and south, mostly, but some few run east and west. The well water is generally quite hard, and the water in them is from surface drainage in a majority. We have a great deal of wood land—more wood land than open. The vegetation is very luxuriant.

I. B. C.

#### TIVERTON.

2. There has not been much more sickness during the past year than in previous years. I judge that it perhaps would stand in proportion of 10 to 9.
3. So far as deaths are known (for the law is poorly complied with, many dying and are buried without a legal return having been made) there has been nearly the same number, average being about forty.

4. Many cases have been reported as Diphtheria, and in my own circuit I have seen several cases of "Diphtheritic Sore Throat" which I labelled Membranous Sore Throat, they not having the characteristic symptoms of true Diphtheria. Such cases have extended through the whole year, being two or three cases at a time; each case will have a continuance of from (3) three days to one week. One, a boy, died under treatment, or without it, probably from Membranous Croup, as the case has been given me, although returned by the attendant as Diphtheria.

During the fall of 1878, and continuing until spring of 1879, there were around and in the village of the "Four Corners" several cases of Scarlet Fever; also, eight or ten cases on Puncateese Neck. I have been unable to ferret out their origin, but the spread of the disease was due to carelessness regarding quarantine. A few deaths resulted therefrom, although it appeared in a very mild type.

In July and August there appeared in the east part of the town a number of cases of Dysentery following one another. (5.) The disease presented a typhoid character and was quite fatal, there being about 40 per cent. deaths of those attacked. At the same time infants succumbed to Cholera Infantum. The months were very dry and many wells had failed; (6) as the soil is very sandy and apt to leach, I concluded that foul water would account for it.

7. Pneumonia, Bronchitis, Rheumatic complaints are very prevalent during cold months.
9. In the fall there were a few cases of Typhoid Fever occurring sporadically. Diphtheria and Scarlet Fever as before mentioned.
10. Typhoid Fever occurred in the family of J. N., beginning with Mrs. and followed by two children about 13 and 15 years of age (at the Bridge), also Mr. B., two miles (nearly) north, one case. Scarlet Fever in October in family of Mr. C., whose house is three-fourths surrounded by water, no neighbors except south 30 rods, or over the "cut" about 50 rods, where there is a large tenement house, the *drain* of which is about four rods long, leading on the surface to the water and uncovered, much of the time partially filled with stagnant water and other filth.
11. See 10, Typhoid Fever; also cases of Scarlet Fever before mentioned. I will refer to a case occurring in my practice in Massachusetts in 1876, fall. The family of S. D. were visited by a friend who had been where they had had the Scarlet Fever in another town. This friend had held a child for a few minutes who was at the time quite sick with the disease. In the course of a day or two she arrived at Mrs. D.'s and held one of her children. The others were about her. I do not know how long she remained in the family, but I think not over night. In due time the child became sick; then an older daughter came down, and still another within a day and a half. The second day the daughter first sick died, and the day following the other daughter died, both from malignant form of the fever. The boy passed on to Nephritis and died, and another daughter died. The oldest sister and brother came down about nine days from the first, but had it in a mild form and recovered.

A child in a family three-fourths of a mile distant, also exposed, died. No other cases to my knowledge at the time.

12. I can hardly locate it by localities. The town is not what I consider a particularly healthy one; too much wet land, causing Rheumatism and lung troubles.
13. I know of but one case of opium eating habit.
14. Drainage and scavenging only such as nature furnishes.

E. P. STIMSON.

#### TOPOGRAPHY.

This border town, surrounded on two sides by Massachusetts, and one side by water, presents the usual features of a coast town, except that it has no large streams crossing its territory. In the northeast, the town has on its border a large pond, South Watuppa, and connected with this by a small stream, Stony Brook, is Sarody Pond; these two ponds, with the brook, form about one-half of the eastern border, on Massachusetts, and about three-fourths mile northwest, inland from the mouth, or north end of Sarody Pond, is Stafford Pond, of about three-fourth mile in width and two and one-half miles long, running northwest from southeast. Its outlet is Eagle Brook, which has one dam in the town, forming the mill pond of the Eagle (Cotton) Mills, long since discontinued and now for sale. This brook courses to north and east, and finally reaches the Watuppa Pond, and empties into the bay by Fall River Quinque Channel, the ancient north line of the town. Further inland, a mile or more, they form Stafford Pond, and directly west, and covering several acres, is a large bog, Pocassett Cedar Swamp, quite springy, and containing a small pond, giving rise to a stream, "Sin and Flesh," or "Sinning Flesh" River. This small stream of clear and sparkling water, flows a general southwest direction, with but one dam, which forms an ice pond. It empties in Quaket Pond at "Snell's" Bridge; whole length, probably two miles. From Sarody Pond west, a mile and a half, is another extensive boggy swamp, Basket Swamp, giving rise to a brook called Crandall Brook, which runs nearly south—little east of south—and from a mile to a half mile west of Massachusetts line; is from three and one half to four miles in length, emptying, just after it leaves town, into Adamsville river (tide water), and has one dam for a grist and saw mill, one dam for a carding mill in town, and just over the line is another dam for small power; nearly the whole length of this brook is swamp land, from one-fourth to one-half mile in width.

In the centre of the town about a mile and a half long and half a mile in width, is the "Great Cedar Swamp," giving rise to Borden brook, flowing south and west, which has a saw mill, now disused, a dam which furnishes power for grist mill and wheel-wright, and then empties into tide water.

The grist mill pond, in suitable weather, furnishes ice for the inhabitants about the "Four Corners." The western border, or shore land, is quite straight from the north line down to "Bridgeport;" here a cut about one hundred feet wide allows tide water to flow a pond called "Nanna Quaket. This pond is from one-fourth mile at Bridgeport to about ten rods wide at its head, a mile and one-

fourth directly south from B. This pond receives three tributaries, viz.: Sinning Flesh, White Wine, and Quaket brooks. The two last being very small and unimportant except it be that Quaket Brook, three-fourths of a mile long and nearly its whole course, viz.: southwest, west and northwest, is bordered by wet and swampy land, near also to habitations. The peninsula formed between this pond and the bay, is called Nanna Quaket, and contains some of the best farm land in the town.

From the south line, and extending to the north, is another inlet, which is nearly closed by obstruction at its mouth, opening into the Nonquit Pond, which at its south end is about one-fourth mile wide, and increases variably in width to one-half or three-fourths mile, extending to the north about one and one-fourth miles. I think it is the recipient of two small streams: the one before mentioned and a small stream from the north of Little Compton.

The peninsula here formed is termed Puncatees Neck, and extends south; is disconnected from "Quaket" on the north by "Seapowet" Creek, an inlet from the bay.

Much of the Neck is wet, and unfit land for cultivation, while that bordering "Seapowet," is an extensive salt marsh.

(B.)

There is but one range of hills, of an elevation at the highest of about 100 feet, with *sloping* sides, with an area of about two-thirds of the town. The eastern and western descents are more abrupt, while the top is very gently sloping and contains the swamp, etc. The surface of the soil in uncultivated parts of the town is thickly covered with rocks or boulders, from one ounce to many tons weight, while in many places ledges of rock crop out. In the cultivated portions, these boulders have been in great part removed, leaving a rich soil for cultivation, consisting of sandy loam, clay, etc., with but little gravel; sub-soil, mostly clay. I should judge about two-fifths of the land is used for cultivation and three-fifths left for wood land, a good share of which has been cut off the last ten years and left to grow up again.

(C.)

Sarody Pond which borders the east part of the town, is not situated so as to affect the health of families in this State, but during the latter part of summer the edges are left bare, so that there is a malarial odor from it when the wind is easterly.

Stafford Pond has generally steep banks, and any lowering of its water does not affect the shores.

Quaket Pond is only affected by tide water. At low tides the head of the pond is left one great marsh, which in hot weather exhales the usual sea-marsh odors. The same may be said of Nonquit Pond.

I think of no water-pens near to any village which would affect the health.

(F.)

The wells are the dependence of our people for drinking-water, and are of various depths; there are no usual depths. In the east part of the town where the

sandy soil exists, the wells are apt to be dry in a dry season, if not twenty-five or more feet deep, while on the main road, most of the wells are through rock, and vary from thirty to seventy feet. Most of the water is very pure. The wells at or near Quaket Brook Swamp, have a brackish taste, especially so in warm weather; and they are also easily affected by heavy rains during a dry time. On Quaket, the depth of well is very uniform with the height of land above sea level, the bottom of the well reaching nearly to the level of high water mark.

I had hoped to furnish you with a map of the town, with the many places marked thereon, but I have been unable to procure one. Much business has prevented my finishing the report sooner. Another year and I hope to be better able to answer the many questions, as I shall be better acquainted with the different soils, etc.

We are now having a few cases of Scarlet Fever, brought from Fall River, where the people are very careless with it, and no attention seems to be paid to the law on that subject.

E. P. S

#### NEWPORT.—CLASS I.

2. The amount of sickness of all kinds in the city, taking the whole year together, has been less than the average of years.
4. In the spring of 1879, an epidemic of influenza, with an epidemic of conjunctivitis; no other.
5. No prevalence of endemic disease, in any locality.
7. No special sickness of large extent has occurred during the year.
8. No disease has been unusually fatal.
9. Hooping Cough, Measles and Small-Pox, have been entirely absent.
10. Diphtheria and Typhoid Fever in limited numbers, have been present. The same may be said of Scarlet Fever.
12. The localities in Newport most unhealthy are in the thickly settled portions of the city. The unhealthiness is caused by bad drainage and bad water.
14. Streets kept moderately clean, and house refuse and garbage removed by public carts. Drainage defective; sewers in some of the streets.

#### REPLY TO NO. 11.

During the past year comparatively few cases of Typhoid Fever and Diphtheria have taken place within the city limits. Those which came under my own observation, were in each case caused by bad drainage; and I may here state that during the past few years, I have not had a case of Typhoid Fever or Diphtheria where I have not found defective drainage in the home where the patient was first taken sick. The cases of Typhoid Fever and Diphtheria which have come under my care during the year, have been of very mild form.

During the past year, but very few cases of Scarlet Fever have taken place, in Newport. Under my own care the first case occurred during the last week of

December. The contagion was brought by a nurse from Fall River. The child slept with the nurse and was taken with a malignant form of the Fever, and died after four days' sickness. Five (5) other members of the family have since been sick with the fever in a very severe form. At the same time, four (4) other members of the household have been sick with very severe sore throats, two of which have been Diphtheritic in character. The home in which the sickness has taken place is first-class. The drainage, however, has been found to be defective, and water contaminated from house drains.

## REPLY TO NO. 13.

I have been able to obtain the following record of thirteen well known opium eaters, who use what is equivalent to 34,000 grains of opium a month. There are doubtless many others who obtain the drug from outside sources; and three, not included in the thirteen, have been using for years, compound prescriptions containing opium.

(1.) A woman—has obtained from a druggist the gum opium, at the rate of half a pound a month, for over thirty years.

(2.) A woman—obtains one ounce of gum opium a week.

(3.) A woman—uses two (2) drachms of sulphate of morphia *a week*.

(4.) Obtains eight ounces of laudanum a week.

(5.) Obtains two ounces gum opium a month.

(6.) Obtains two ounces laudanum a week.

(7.) A remarkable case of a woman who has taken laudanum for twenty-five or thirty years, and for the past seven years has used *four (4) ounces of laudanum every day*.

(8.) Obtains one-half ounce of gum opium a week.

(9.) Obtains eight ounces laudanum a week.

(10.) Obtains for hypodermic injection, one ounce of Magendie's sol. morphia *a week*.

(11.) Obtains one quart of laudanum a month, and has used it for over thirty years.

(12.) Obtains two ounces of Magendie's sol. morphia every five (5) days for hypodermic use.

(13.) Obtains two ounces of gum opium a month.

In the above I have stated the quantity, and periods at which the various opium eaters procure their drug.

In a rough estimate, these thirteen opium eaters use over 34,000 grains of opium a month. Only one druggist in Newport refuses to sell opium to known opium eaters. There are no known arsenic eaters in Newport. F. H. RANKIN.

## TOPOGRAPHY.

(A.)

There are no streams of water within the city limits; no dams, and no mills run by water power.

(B.)

The only hill in the city limits is one 125 feet high, in the extreme north end of

the city. The greater part of Newport is situated on an elevation of 40 to 60 feet above tide water, surrounded by water; the western slope is abrupt and rocky; the eastern, of more gradual descent. A large portion of the city is composed of country seats which are occupied only during the summer months. The ground is well and highly cultivated, and is well supplied with shade-trees, although there is no wood land. The rocks crop out largely on the western border of the city. The underlying rock in the resident portion of the city, consists largely of slate, through which runs a stratum of coal. The character of surface soil is principally loam and is very retentive of moisture; the sub-soil composed chiefly of clay, (hard-pan), with no lime, and very little gravel. Southeast of the resident portion of the city, is a large tract of rocky land of several hundred acres in extent. This is for a greater part devoid of surface soil.

(C.)

Within the city limits are three ponds. There is some bog land not in close proximity to the thickly settled portion of the city, and which, during a long dearth of rain-fall is in a very dry condition.

(D.)

There are no large valleys within the city limits.

(E.)

The resident portion of Newport consists of an elevated plateau, two and a half miles long by one-half to three-quarters of a mile broad, and from forty to sixty feet high; the highest point, however, is one hundred feet high. The general characteristic of surface soil is described in answer to question B.

(F.)

The average depth of wells in the higher portion of the city is twenty-five feet; in the lower portions, ten to fifteen feet. The water is hard, and in the thickly settled portion of the city is unfit for drinking, being highly charged with impurities of drainage matter.

Fully aware of the meagreness of this report, in reply to questions under Class II, I shall have to solicit the indulgence of the State Board of Health. During the present year a careful geological survey of Newport and its surroundings will be made for the National Board of Health, and when this is accomplished, a full report will be sent to the State Board.

Very respectfully,

F. H. RANKIN.

NORTHERN PART OF CHARLESTOWN, WESTERN PART OF RICHMOND, HOPKINTON,  
AND NORTHEASTERN PART OF WESTERLY.

2. The proportionate amount of sickness in this circuit during the year 1879, does not show much difference from previous years.
3. The proportion of deaths from all causes in the same territory, compared with previous years has been less.

4. There has been an epidemic of Scarlet Fever in (Ashaway) the south-western part of Hopkinton, which continued some three months, very mild in severity. No deaths reported to my knowledge. Was confined to no locality, and was probably propagated through the school.
5. No endemic diseases have prevailed during the year 1879.
7. The diseases not epidemic that have prevailed in the course of the year to an unusually large extent are Typhoid Fever, Diphtheria and Hooping Cough.
8. No diseases have been attended with an unusual fatality.
9. Small Pox has not occurred during the year.
10. The diseases that have occurred sporadically are Diphtheria and Typhoid Fever.
12. No localities in this circuit peculiarly unhealthy.
13. The eating of Opium prevails to a small extent; can recall some six or seven persons; none of Arsenic. Am of the opinion the private use of Chloral Hydrate is on the increase.

A. B. BRIGGS.

HOPKINTON, RICHMOND AND WESTERN PART OF EXETER.

2. The proportionate amount of sickness of all kinds during the year 1879, compared with previous years, has been 25 per cent. less.
3. Many old people have died, making the number nearly an average.
4. No epidemics have prevailed.
5. No endemic diseases have prevailed in this circuit during the year 1879.
7. The diseases that have prevailed in the course of the year to an unusually large extent, are Typhoid Fever and Hooping Cough.
8. No diseases have been attended with an unusual fatality.
9. Measles and Small Pox have not occurred during the year.
10. The diseases that have occurred sporadically are Typhoid Fever and Scarlet Fever in south-west part of the town of Hopkinton.
12. No localities in this circuit peculiarly unhealthy.
13. Opium is used to some extent (very limited). I know of no arsenic eater.
14. The population is not dense enough to require any special means of scavenging.

E. P. CLARK.

SOUTH KINGSTOWN.

2. The proportionate amount of sickness of all kinds in this town during the year 1879, compared with previous years, has been less by 20 per cent.
3. The proportion of deaths from all causes in the same territory, compared with previous years, was about 20 per cent. less than the average.



4. No epidemics have prevailed in this section during the year 1879. Diphtheria and Measles have appeared in localities in limited numbers. Otherwise only the ordinary diseases of the seasons.
5. No endemic diseases have prevailed during the year 1879.
7. No diseases have prevailed in the course of the year to an unusually large extent.
8. No diseases have been attended with an unusual fatality.
9. The following zymotic diseases, viz: Typhoid Fever, Hooping Cough, Scarlet Fever, and Small Pox have not occurred during the year.
12. No localities peculiarly unhealthy.
13. A few persons, perhaps a dozen or so, use Opium or its alkaloids. No Arsenic used to my knowledge.
14. No system of scavenging practised; natural drainage good.

C. E. MARYOTT.

#### TOPOGRAPHY.

##### (A.)

The principal stream Saugatuck river, with dams and mill ponds at Peacedale and Wakefield, a side branch with dam and pond at Rocky Brook. Mills have steam power also. Saugatuck runs southerly, empties into Point Judith salt pond.

##### (B.)

Land rolling, hills, principally north and south in direction, east and north ledge near surface, south and west gravel, broken surface, proportion of wood land small. Tower Hill, 150 feet high, overlying a stratum of Plumbago.

##### (C.)

Large pond (500 acres), surrounded by swamps in west part of town, drains into Pawcatuck river. Point Judith pond south east (2000 acres.)

##### (D.)

No valleys, properly speaking.

##### (E.)

Plains not large, mostly gravel.

##### (F.)

Well water in some places from mill ponds and rivers; generally soft, good quality. Wells shallow on the hills, deeper on the plains, medium depth in manufacturing villages, impregnated with iron in a few places. Many cisterns in the villages.

##### (G.)

Principal dip of rock formation, north-east; granite.

C. E. M.

## WESTERLY.

2. The proportionate amount of sickness of all kinds in this town during the year 1879, compared with previous years, was about the same as usual.
3. The proportion of deaths from all causes in the same territory, compared with previous years, was larger.
4. We have had no epidemic diseases, except in the months of February, March and April, when an Influenza prevailed, which was very general and quite severe, especially among the old and young.
5. No endemic diseases have prevailed during the year 1879.
7. No diseases have prevailed in the course of the year to an unusually large extent, unless Neuralgia be excepted.
8. No diseases have been attended with an unusual fatality.
9. Small-Pox has not occurred during the year.
10. Diphtheria, Typhoid Fever, Scarlet Fever, Hooping Cough. Generally wherever Diphtheria has occurred it has been in houses surrounded by filth either in the house or around the premises. Defective cess-pools for sink water I consider a common cause of Diphtheria in my circuit.
12. We have no localities that I consider "peculiarly unhealthy." We have healthy surroundings, a good atmosphere, and there is current enough up and down our river to keep the atmosphere constantly in motion.
13. I know of no Arsenic eating. Opium is used to some extent. I know of some six or more persons who use it constantly.
14. We have no systematic method of scavenging our streets. It is not necessary with our population, especially with the good drainage that we have. Nature and art both have combined to make our drainage good.

H. N. CRANDALL.

## REPORTS FROM TOWNS

### IN RELATION TO LEGAL SANITARY MEASURES.

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A circular was sent, at the close of the year 1879, to the town clerks of all the towns in the State, requesting replies to several questions, and among them was the following:

"What legal measures or regulations have been adopted, or work of a public or private nature, contemplated, commenced or completed in 1879, by the consent, or under the direction of the town council of your town, or any legally authorized health officer or board of health in the town, in relation to the promotion of the public health?"

Replies were received from the following towns:

#### BRISTOL COUNTY.

##### BRISTOL.

"No new sanitary regulations have been adopted by our Town Council, since August 6, 1879, when Philip B. Bourn was appointed health officer (under an ordinance of the town), to make a thorough inspection as to the sanitary condition of the town, which was accordingly done by said officer." P. GLADDING.

Warren and Barrington, no report.

#### NEWPORT COUNTY.

##### JAMESTOWN.

"At a meeting of the Town Council, held August 18, 1879, John B. Landers was appointed health officer, to visit all vessels on their coming to anchor within the jurisdiction of the town of Jamestown, to examine into the sanitary condition of said vessels. J. E. WATSON.

At a subsequent meeting of the Town Council the following quarantine regulations were adopted, and the duties of the health officer defined:

I. That it shall be the duty of the health officer to visit all vessels immediately, on coming to anchor within the jurisdiction of the town of Jamestown, to examine into the sanitary condition of said vessels by personal inspection or otherwise as in his judgment may seem best.

II. That in case the said health officer shall find on board any vessel, any contagious or infectious disease, or that there *has been* any such disease on board said vessel, or any vessel that has been recently in any port where any infectious disease is prevalent, he shall cause a yellow flag to be hoisted and kept constantly in the shrouds during the time the said vessel shall remain within the jurisdiction of the said town, and shall also require the commander of such vessel to give notice of the occurrence of any new case of infectious disease on board of said vessel, by such signals as the said officer may devise.

III. Said health officer shall allow no person to leave any vessel infected with a disease dangerous to life, or any vessel suspected of such infection, or go on board or visit any such vessel, without his permission.

IV. All supplies of every kind whatsoever shall be taken on board such vessel *only* by permission and under the direction of said health officer, and no articles of any kind whatsoever shall be taken out of or from such vessel to any landing place.

V. Every person who shall violate any of the regulations hereby adopted by the Town Council of the town of Jamestown, shall be deemed guilty of a misdemeanor, punishable by fine or imprisonment, in conformity with the General Statutes, and at the discretion of the court by which such offender shall be tried.

#### TIVERTON.

"In answer to the inquiry in relation to sanitary measures adopted by the town, I will say that no particular work has been undertaken or contemplated, as regards public health."

G. N. DURFEE.

#### PORTSMOUTH.

"In reply I have to say, there has been nothing new in any act of the Town Council of this town, during the year 1879, for the promotion of the public health, although there has been some talk of directing the Town Sergeant to visit some sections of the town, with that object in view."

P. B. CHASE.

#### CITY OF NEWPORT.

The following resolutions were passed during the year 1879, by the Board of Aldermen acting as a Board of Health.

*Board of Aldermen.—July 22d, 1879.*

*Resolved*, That until such time as suitable legislation can be procured for the creation of a separate board of health, this Board respectfully invite Dr. George Engs, Capt. Joseph P. Cotton, and Dr. Francis H. Rankin, to act with them as an advisory Board of Health, to assist them in the preparation of such rules and regulations as may be thought necessary, and to advise with them upon all matters concerning the Sanitary care of the city.

*Board of Aldermen.—August 12.*

*Resolved*, That the gentlemen appointed to advise with the Board of Health, with Aldermen Bull, Crosby and Brown, are hereby requested to consider the operation of the statutes relating to the collection and return of vital statistics in this city, and if found necessary, to suggest some method to insure a proper compliance with the laws on the part of physicians, clergymen and undertakers; and also to consider and report any desirable changes or improvements for the sanitary condition of the city in general.

*Board of Aldermen.—November 4.*

*Ordered and Resolved*, By the Board of Aldermen of the city of Newport, acting as the Board of Health in said city, on this 4th day of November, A. D. 1879: That from and after the first day of next March, no swine shall be kept within the limits of the compact part of said city, which said limits are established by the ordinance of said city, and every person violating this rule and regulation shall be fined twenty dollars for every offence.

The following ordinances in relation to the promotion of the public health were passed during the year by the City Council:

*It is ordained by the City Council of the city of Newport as follows :*

SECTION 1. The twelfth section of Chapter 20 of the Ordinances of the City of Newport is hereby amended by inserting therein after the word "year," the words, "nor between the hours of ten o'clock in the forenoon and five o'clock in the afternoon of any day."

SEC. 2. No person shall remove the contents of any privy vault or cess-pool nor any swill or garbage through or into any street or highway of this city in any vehicle of any description, without first obtaining a license for such vehicle from the Board of Aldermen of this city, or from some person authorized by said Board to grant such license; and every such license shall be numbered and the number thereof shall be painted in a conspicuous place on the outside of the vehicle thereby licensed, in white figures at least two inches square on a black ground.

SEC. 3. This ordinance shall take effect immediately, and every violation of it shall be punished by a fine of twenty dollars.

[Passed December 2, 1879.]

AN ORDINANCE RELATIVE TO THE REGISTRATION OF BIRTHS AND THE REPORTING  
OF CERTAIN DISEASES.

*It is ordained by the City Council of the city of Newport as follows :*

SECTION 1. Every physician shall, on the first Monday of every calendar month, deliver and leave in the City Clerk's office for the Board of Health, a record, signed by him, of every birth at which he shall have attended in said city during the last preceding calendar month; and said record shall be made out in the form prescribed in such case in Section 3 of Chapter 77 of the General Statutes of this State.

SEC. 2. Whenever a birth shall take place in said city, at which no physician shall have attended, a record thereof shall be made as aforesaid, and shall be delivered and left in the City Clerk's office as aforesaid, within one week thereafter by the father of the child so born, if the mother thereof be married and the father thereof be living, or otherwise by the mother of such child within sixty days after the birth.

SEC. 3. Printed blank forms for making said records shall be furnished at the City Clerk's office to all proper applicants therefor.

SEC. 4. Every physician shall report in writing to the Board of Health of this city, or to some member of said Board, every case attended by him of Small-Pox, Measles, Diphtheria, Scarlet Fever, Typhoid Fever, Typhus, Yellow Fever, Cholera or Cerebro-Spinal Meningitis. Said report shall be made within twenty-four hours after the physician shall have ascertained the existence of the disease to be reported, and shall contain the name, age, sex and residence of the patient.

SEC. 5. This ordinance shall go into immediate effect, and every person violating any of its provisions shall be fined not less than five dollars nor more than twenty dollars for every offence.

[Passed December 2, 1879.]

WM. G. STEVENS.

The following circular in relation to the provisions of the ordinance above reported, will explain itself:

MAYOR'S OFFICE, City of Newport.

*To Physicians in Newport:*

Herewith I send you a copy of an ordinance passed by the Honorable City Council, December 2d, 1879.

You will perceive that this ordinance requires reports of births to be made, also requires information to be given of the existence of cases of contagious, infectious or epidemic sickness. The want of this information has been long felt, and its importance must be obvious to all. It supplies to the Profession most valuable knowledge in regard to the ratio of deaths to cases of sickness, and gives the opportunity to take measures to prevent the spread of disease before the death of the patient.

Printed blanks and envelopes will be furnished to all physicians, so as to make as little trouble as possible in complying with the ordinance.

Physicians are requested to report *all cases of contagious, infectious or epidemic sickness existing at this date*, and hereafter, all cases as soon as known. In addition to the simple report of the case, they are requested to furnish any information in regard to the supposed causes of the disease, and evidence of contagion, or any causes of sickness about the premises that may be removed. Reports of every case are required, *even of the slightest*, as these are necessary for a correct record and statistics.

These reports may be left at the City Hall or be sent through the post office.

Please write the names plainly, give the exact age in years and months, give the residence definitely, so that it can be easily found, and give the exact date when the patient was taken sick. Additional blanks will be furnished at any time on application at the City Hall.

In addition to the diseases named in the regulations, physicians are invited to report cases of any other contagious, infectious, or epidemic diseases, including all usually called zymotic disease.

Truly yours,

J. TRUMAN BURDICK, *Mayor*.

It should be stated by the Secretary, that early in the present year, 1880, a burial and removal permit ordinance was passed by the City Council, which will effectually secure complete returns of deaths in that city. In connection with the ordinance passed Dec. 2d, 1879, in relation to returns of births, the record of the occurrence of these two classes of events must, with a proper obedience to law, be all that could reasonably be desired in regard to fullness and accuracy.

The promptness of the Mayor and other officials in the preparation and issuance of the blank forms and directions necessary to the enforcement of the ordinances respecting births and deaths, and reports of existing contagious diseases, is worthy of commendation, and doubtless reflects the public sentiment of Newport in relation to general sanitation. It is suspected the Advisory Board of Health have labored actively in the procurement of such desirable results.

No report in relation to the sanitary work of the Town Councils in the following towns, viz.: Little Compton, Middletown and New Shoreham.

#### KENT COUNTY.

##### COVENTRY.

"No new regulations, or works of a public or private character for the promotion of public health, have been adopted, commenced or contemplated."

S. W. GRIFFIN.

##### EAST GREENWICH.

"In answer to your communication, I would say, there has been nothing commenced or ordered by the town council of this town, having in view the promotion and protection of the public health."

E. STANHOPE.

##### WEST GREENWICH.

"In reply to yours of Jan. 8, I would say, that no regulations of the nature you speak of, were made during the past year by the town council of this town."

W. N. SWEET.

##### WARWICK.

"I know of no regulations or work contemplated, commenced or completed,

by or under the direction of this town, having in view the promotion and protection of the public health." S. W. THORNTON.

### PROVIDENCE COUNTY.

#### BURRILLVILLE.

In relation to the nuisance of an extensive piggery in the eastern part of the town, of which many complaints had been made, (and for which Chapter 750 of the Public Laws had in part been enacted, in order to bring the matter unavoidably before the town council), the town clerk writes as follows :

" At a meeting of the town council, held March 29, 1879, upon the consideration of a petition, it was voted 'that the farm of Nelson Armstrong, in the town of Burrillville, lying on the Providence and Springfield Railroad, be, and the same hereby is, designated as a place where swine, and animals of the hog kind, may be kept and fed on swill, offal and other decaying substances brought from said town and from other towns and cities, from now until April 1, 1880, and no longer.' No other action taken."

ALVAH MOWRY.

It has not been officially stated whether the nuisance was abated at the time designated, but such a report comes from other sources.

#### CRANSTON.

" Our town council passed ordinances in 1879, to prevent persons from bringing into the town the contents of privy vaults and other offensive matter, for the purpose of depositing the same, a practice that had become quite common; those were the only sanitary regulations made during the year 1879."

J. M. WHEELER.

#### CUMBERLAND.

" The town council of this town did not in the year 1879 pass any new regulations in regard to the protection of the public health."

H. A. FOLLETT.

#### FOSTER.

No action of the Town Council of this town during the year 1879 in relation to nuisances or having direct relation to the promotion of public health, has been reported. But the Town Clerk, by order of the Council, prepared an excellent synopsis of the General Statutes in relation to the returns of births, marriages and deaths, which was printed on sheets fourteen by seventeen inches in dimensions, and posted in conspicuous places in all sections of the town. The Town Councils of all towns where burial permits are not required, would render essential service to effective registration by a similar order. It is particularly desirable that all persons should be informed of the



fact that they render themselves liable to a fine of twenty dollars, for neglect to make a return of the death of any person whose funeral they conduct, or whose burial they assist in.

## GLOCESTER.

"No action by the town council in view of the promotion or protection of public health."

C. W. FARNUM.

## NORTH SMITHFIELD.

"In regard to the inquiry as to what action the town council of this town has taken, during the year 1879, in relation to the promotion of the public health, I would say that the council resolved to constitute themselves an active board of health for all needed purposes. Mr. John H. Higgins, president of the council, is superintendent of the mills in the village of Forestdale, and is very particular to have every thing about the village kept neat and in a healthful condition. Each of the members of the council took it upon himself to look after his part of the town, and see that every thing was done to prevent the spread of any contagious diseases."

A. HOLMAN.

## PAWTUCKET.

"In reply to your note of inquiry, would say that no action has been taken by the town council of this town in relation to public health during the past year."

L. PEARCE.

## SMITHFIELD.

"In reply to yours of 8th January, I would say that no action whatever, of the nature indicated, was taken by the town council during the past year."

O. A. TOBEY.

## WOONSOCKET.

"Yours of 8th inst. received. In reply I have to say that the town council of this town have not made any new regulations, during the year 1879, having in view the promotion or protection of the public health."

A. E. GREENE.

## CITY OF PROVIDENCE.

The following are the only *new* acts or regulations adopted during the year 1879:

## CONCERNING STREETS.

(July 17.)

"Ordered that no street or portion of any street in the city shall be watered, unless the decomposing filth in such street or portion of such street shall be first thoroughly removed."

"Ordered that any person who shall violate the provision of the above regulation, shall pay a fine of not less than one dollar nor more than ten dollars for each offence, on complaint brought by the Chief of Police."

## REGULATIONS.

*Providing for obtaining Reports of Cases of Contagious, Infectious, or Epidemic Sickness.*

(Adopted December 26, 1879.)

1. Every physician having knowledge of the existence of any case of contagious, infectious, or epidemic disease within the city of Providence, shall immediately make a report thereof in writing, to the superintendent of health of said city, with such particulars as the said superintendent may indicate on blanks furnished for that purpose.

2. The diseases referred to in the preceding section, shall, among others, include especially small pox, diphtheria, typhoid fever, typhus fever, scarlet fever or scarlatina, cerebro-spinal meningitis or spotted fever, measles, and hooping cough.

3. Any physician who shall fail to comply with the preceding regulations, shall be fined not less than two dollars nor more than ten dollars for each day of such neglect, after having knowledge thereof as aforesaid.

In addition to the above, the following circular was issued:

## OFFICE OF THE SUPERINTENDENT OF HEALTH.

*To Physicians in Providence :*

Enclosed, I send a copy of regulations adopted by the board of aldermen, December 26th, 1879.

You will perceive that these regulations provide for obtaining information of the existence of cases of contagious, infectious or epidemic sickness. The want of this information has been long felt, and its importance must be obvious to all. It supplies to the profession most valuable knowledge in regard to the ratio of deaths to cases of sickness, and gives the health officer an opportunity to take measures to prevent the spread of disease before the death of the patient.

Blanks printed on postal cards will be furnished to all physicians, and also other blanks on half sheets of note paper, and envelopes directed to me, so as to make as little trouble as possible in complying with the regulations.

Physicians are requested to report *all cases of contagious, infectious, or epidemic sickness existing at this date*, and hereafter, all cases as soon as known. In addition to the simple report of the case, physicians are requested to furnish any information in regard to the supposed causes of the disease, any evidence of contagion, or any causes of sickness about the premises that may be removed. If anything more than the simple report of the case is made, the blanks on note paper may be used. Reports of every case are required, *even of the slightest*, as these are necessary for a correct record and statistics.

These reports may be left at my office in the City Hall, or be sent through the post office, or be left at the nearest police station, or be given to any police officer.

Please write the names plainly, give the exact age in years and months, give the residence definitely, so that it can be easily found, and give the exact date when the patient was taken sick. Additional postal cards and blanks will be furnished at any time on application to my office, or by mail.

In addition to the diseases named in the regulations, physicians are invited to report cases of any other contagious, infectious, or epidemic diseases, including all usually called zymotic diseases.

Truly yours,

EDWIN M. SNOW,  
*Supt. of Health*

No reports from East Providence, Johnston, Lincoln, North Providence and Scituate.

#### WASHINGTON COUNTY.

##### EXETER.

"The town council of Exeter has not taken any action, or made any regulations, with reference to the public health, or sanitary condition of the town, or any part thereof, during the year 1879."

N. B. LEWIS.

##### HOPKINTON.

"No ordinances or regulations of the kind indicated have been adopted or passed by the town council of this town."

E. R. ALLEN.

##### NORTH KINGSTOWN.

"In reply to yours of a late date, I would say that there has been nothing done by the town council of North Kingstown in regard to the sanitary condition of this town. In fact, it does not appear that any thing needs to be done. If you have any suggestions to make in regard to sanitary measures and will do so, I will lay the matter before them."

J. B. PIERCE.

##### SOUTH KINGSTOWN.

"There was no regulation adopted, or work of a public or private nature contemplated, commenced or completed, in 1879, by or under direction of our town council, in relation to public health. If it is desirable that something should be done in this matter, please inform me what, and I will do what I can to set it going."

J. G. PERRY.

No reports from Charlestown, Richmond and Westerly.

## CATTLE COMMISSION.

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This department of the work of the State Board of Health, has during the entire year, demanded a great deal of time and attention. It has been the design of the Secretary, to allow no report of any suspected disease, possibly contagious, or affecting any considerable number of animals, to be received without giving it immediate attention.

The work, however, has been mainly in the direction of the discovery and disposal of glandered horses. A recital of the difficulties encountered in ascertaining the places of concealment or ownership of some horses suspected of having the disease, whose owners, upon the first suspicion on their own part, of the nature of the disease, or the fear, or knowledge of the fact, that the case would be, or had been reported to the Secretary, had removed them to other places, or disposed of them to other parties, would be amusing to persons unacquainted with the perplexities of the search.

The various devices by which a clue is obtained and followed up, and others reached until the final discovery, are such as might be employed in the detection and arrest of criminals.

No instance is now remembered, in which an animal reported to the Secretary as suspected, has not finally been traced out and effectually disposed of, for it has so happened that in every case where concealment has been attempted by frequent sales or removals, that the disease has been evident on first inspection, and condemnation was the only alternative. In one instance, a horse was traced from Providence through several towns in a zigzag route, not remaining more than a few days in a place, into another State, and finally into Washington county, where it was found and destroyed. The horses that are so transferred from place to place, and from one owner to another, in the city or the country, (and it is in the country towns where they can be kept longest without detection) are almost always such as have been bought and sold for less than fifty dollars, and much more frequently for less than twenty-five.

The owners of such horses are usually parties whose means are quite limited, and who feel indisposed to meet any or at least much loss on them, and so, upon the first intimation of disease, dispose of them as soon as possible. By means which would be suggested to any common person, the most obvious symptoms of the disease can be arrested or concealed for a few hours, and this circumstance affords an occasion for disposal, which is taken advantage of the first opportunity. Some of the horses which have been condemned could be traced through various selling prices by different owners in a few weeks, from forty or fifty dollars down to five or ten.

These are the horses which endanger the public most. They are in the hands of unscrupulous owners, who have no regard for the rights or property of others. Such diseased horses are more frequently brought into contact with the horses of unsuspecting persons, on the street, at the watering troughs, the feeding troughs, or in the transient feeding stables. By such means the disease may be indefinitely perpetuated.

It is believed that if the owners of such horses could realize some considerable part of the price paid for them, they would quite frequently report for themselves, and voluntarily relinquish possession. In such case the animal would sooner cease to infect others, and the cases would more rapidly lessen in number. With this view, the Secretary would recommend an appropriation by the General Assembly, for the purpose of paying some part of the cost price, to the owner of any horse condemned to be destroyed by competent authority, on account of glanders, said payments to be made under proper checks and restrictions.

The expenses would probably amount to five hundred or six hundred dollars for the first year, and then gradually lessen until the disease had ceased to have any formidable proportions.

The expenses would doubtless be much less for a term of five years, than by the present method.

It has been the rule of the Secretary to visit every animal reported at the office as suspected of having glanders or farcy, either by himself or some other competent person (without additional expense to the State), who was invested with the necessary authority under the official seal.

Of the cases of *suspected* glanders, reported and visited in 1879, not more than one in six has been found affected with that disease.

About one hundred suspected horses have been reported and visited

during the year, by the Secretary or his assistants, in whom no evidence of glanders or farcy was found.

The large number of suspected animals reported, is evidence of a wholesome feeling of apprehension in the communities, and among horse owners a reasonable fear that their own animals may contract the disease, and that they are therefore watchful, in observing any appearance indicating the disease either in their own horses or in those possession of other parties.

In order to assist intelligent persons in detecting the disease, the Secretary was requested by vote of the Board at a meeting held in April, "to prepare a brief statement of the most apparent or obvious symptoms of the disease called glanders or farcy, in style for popular comprehension, and for the purpose of general distribution in the form of circulars or tracts."

The statement was prepared accordingly, and upon approval by the Board, five thousand copies were published; the tract containing in addition, the REGULATIONS adopted by the board in relation to contagious diseases among domestic animals, together with references to the General Statutes, where provision is made and authority conferred for the enforcement of the same.

In form it was as follows:



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[FROM THE OFFICE OF THE R. I. STATE BOARD OF HEALTH.]

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# GLANDERS AND FARCY.

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PUBLIC HEALTH TRACT No. 3.

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POWERS OF THE STATE BOARD OF HEALTH IN RELATION TO CONTAGIOUS DISEASES AMONG DOMESTIC ANIMALS.

By act of the General Assembly, the Board is required to perform all the duties which had been delegated to the Board of Cattle Commissioners, in Chapter 76 of the General Statutes. The law provides in Section 8, of said Chapter 76, that: "The Board may make all necessary regulations for the *prevention*, treatment, cure and *extirpation* of such diseases, (contagious and dangerous to life.) . . . . and every person who shall fail to comply with any regulation by them so made, shall be fined, not more than three hundred dollars, or be imprisoned, not more than one year."

Another section provides that: "If any person shall sell or offer to sell any domestic animal, . . . . known to him to be infected with any contagious disease, dangerous to the public health, . . . . . he shall be fined, not more than one thousand dollars, or be imprisoned not more than two years, or both at the discretion of the court.

In furtherance of the said objects, the State Board of Health have adopted the following regulations in regard to contagious diseases among domestic animals:

1. No person having the care or ownership of any horse or other animal, having the disease called glanders, or any other disease highly contagious and dangerous to life, shall sell or offer for sale, or permit any such animal to go into or be in any public lane or highway, or expose or keep any such animal within the same building, or within fifty feet of any other animal not so infected.

2. Any person having knowledge of any disease or any facts as set forth in the preceding section, shall report the same to some member of the State Board of Health immediately.

3. No horse declared by competent authority to be affected with glanders or farcy, shall hereafter be allowed to be kept for experiment.

DAVID KING, *Chairman*.

CHAS H. FISHER, *Sec'y*.

## GLANDERS AND FARCY.

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The continued prevalence of glanders and farcy, (which are two terms for one disease), in some sections of the State, is owing, in a great measure to the want of a general knowledge of the symptoms of the disease, by which it may be detected, before a large number of healthy animals are exposed to infection. It will be the design of this tract to present the most prominent and characteristic symptoms of the disease, in such manner as will enable those who may come in contact with infected animals to more easily detect the disease in question, and aid in its possible complete extirpation.

Like other diseases, glanders varies greatly in different animals, in regard to severity and rapidity of progress.

The general forms in which it appears are the acute and chronic.

### ACUTE GLANDERS

is that form in which the disease takes on a peculiar malignancy, and rapidly becomes fatal. Many of the symptoms, however, are present in that stage of *chronic* glanders which terminates the disease and the life of the animal.

The acute form is characterized by high fever, loss of appetite, thirst, shrinking of the flesh, skin dry, hair standing out pointing away from the body, the temperature of the mouth or rectum rising from 104° to 109° F. Trembling and shivering also are present, dependent in frequency and degree on the severity of the disease. The urine is usually very much increased in quantity, is clear and thin, the breathing which runs up to forty, and sometimes even to sixty respirations per minute, is hard and labored, the pulse is quick and weak, while the heart can be felt and heard beating strong and loud. The lining membrane of the mouth has a saffron redness, and that of the nostrils is crowded with dark colored blood, and sometimes thickened by swelling.

After three or four days the fever begins to subside, and then there appear, in patches, spread in scattered spots over the lining of the nostrils, little pimples, from the size of pearl barley to a pea, having a bright red border, and a light colored spot in the centre. These pimples ulcerate, and within forty-eight hours leave a depression or pit, with ragged edges, about one-eighth of an inch deep, and with granulations, like what is called "proud flesh," at the bottom.

These pits grow wider gradually, or run together until they cover almost the entire surface of the nostrils, in one continuous ulcerating sore, having a preference, however to the partition of the nostrils, which may be in rare instances perforated through and through. A greenish hue of the diseased surface, will indicate when mortification and perforation is taking place.

At the time of the appearance of the pimples, there will also be a copious discharge from the nostrils, of a thin, yellowish, sticky fluid, not unlike that which occurs in catarrh from taking cold. This discharge gradually becomes thick, varying in color, sometimes streaked with blood, and having the characteristics of matter from an abscess. The quantity is increased rather than diminished.

At this time, also, the glands of the lower jaw become swollen, and somewhat painful, especially from pressure. At first pliable and soft, they soon become hard, rigid and immovable. The inflammation of the nostrils extending to the throat and windpipe, occasions a dry, short, harsh cough, apparently painful and often harrassing.

Pustules or pimples sometimes appear in the windpipe, and greatly increase the difficulty of breathing and the cough.

In some cases the joints swell and become very sore and painful. "Farcy buds," so called, which are small tumors varying in size from that of a pea to a walnut, appear in or beneath the skin in various parts of the body, but more particularly where the skin is thinnest, as on the inside of the thighs and legs, beneath the abdomen, and around the face. These ulcerate, sooner or later, and add to the distress of the animal already overburdened with suffering.

The lungs frequently become inflamed, deposits of glanderous matter resembling tubercles occur in them, which cause ulceration, increase the difficulty of breathing, and hasten the fatal result. Death occurs in from five to twenty days, according to the severity of the disease, and is usually preceded for a day or two by a return of the fever which ushered in the disease and then temporarily subsided.

## CHRONIC GLANDERS.

The first notice of the presence of chronic glanders is usually a continuous discharge from one or both nostrils. There is a form of the disease, however, called "dry glanders," in which the discharge is very slight, and, therefore, unnoticeable; but the cases are exceedingly infrequent. At the commencement, the discharge is thin and clear, but later the transparency entirely disappears, it becomes heavier and more tenacious, crusting within and just outside the rim of the nose, and dripping slowly, or blown in thickened masses from the nostrils. The discharge is at first small in quantity, but becomes more abundant as the disease progresses. The crusts that form around the nostrils, and upon the lips, have a soft, oily feeling when pressed by the finger, but notwithstanding the greasy feeling will usually adhere to any substance with which they come in contact. These crusty accumulations have a dark brown or mahogany color. After an indefinite period of time, depending on the severity of the disease, the discharges assume the appearance of pus, or matter from a running sore. If the disease is to take on a rapid progress, the discharges appear like those in acute glanders, becoming thicker, bronzy in color, and sometimes streaked with blood. This is owing to more rapid extension of the ulceration in the cavities of the nostrils. When the disease progresses more slowly, the discharges are of a light green tint, and continue of that color, until more rapid ulceration or the last stages of the malady occur.

The discharges from the nostrils are not always offensive on account of an inherent fetid smell; the disagreeable odor noticed, in most cases, arising from a retention of the matter, and its natural putrefaction in contact with the air and the breath of the animal.

At the commencement of the disease, if the fore-finger be made to sweep around the internal surface of the nostril, there will be felt little protuberances, as though shot were imbedded in the lining membrane. Or if the rim of the nose be turned over the thumb or finger, there will be seen little oval, or roundish elevations on the surface of the lining membrane, about the size of an ordinary pepper corn, and of a deep straw color, while the lining membrane just around them is whitish and glistening as if polished. In the acute form of the disease, the membrane that borders the pustule is of a bright red.

These ulcerate in a few days, a small quantity of matter is discharged, and a pit is formed as in acute glanders.

These pits, which are usually not more than a half dozen in number, do not spread by surface ulceration *so rapidly* as in the acute form of the disease, and instead of being of a bright red color, are nearer the color of rough slate or sheet lead. The edges also are harder and form an elevated rim around the pit, and the surrounding tissues and base of the pit are hard and gristly.

These ulcerating sores are frequently alluded to under the term of "glander chancres," having a resemblance in their first stages to the chancres of syphilis. They increase in diameter slowly, but steadily and surely, and when there are several in near proximity, they often run together, as in acute glanders, and form one large ulceration, having, however, the same hardened outer border.

In some rare instances, and under very favorable circumstances, the chancres heal, leaving white, circular scars in place of the pits. Such an occurrence should not be regarded as evidence of the extirpation of the disease, but simply an effort of the system to repair its losses, assisted by rest, nourishing diet and the best of attention in every way. The healing of the chancres may go on also, while the disease is active elsewhere, as in the deposition or development of glanderous tubercles in the lungs. But the glander chancres will appear again in the nostrils, and continue on to destructive ulceration.

After a variable length of time the glands beneath and between the jaws become enlarged. If the chancres are present upon or within but one side of the nostrils, the glands are usually swollen only on the same side.

The enlargements vary from the size of a filbert to that of a middling sized peach. For a week or two after the glands become swollen, they are tender upon pressure, and feel like putty enclosed in a thick woolen cloth. They then gradually acquire a firm, stony feeling, uneven over the surface, become bound to the parts around them, and frequently immovably fixed to the jaw bone and skin. These glandular swellings never become running sores.

Many horses are not suspected of having glanders, until attention is called to their condition by some disability, as, for instance, swelling of the joints and fleshy parts of the legs with consequent lameness, general weakness, hurried breathing, nose-bleed, persistent cough, loss of flesh, &c.

And cases occasionally occur in which none of the outward symptoms of glanders appear, the disease being located wholly in the internal organs, as the lungs, liver, spleen, and glands of the bowels.

**FARCY.**

This term simply distinguishes a form of glanders in which there is a local development of the disease in the form of tumors in and beneath the skin. These appear more or less rapidly one after another according to the severity of the general disease, and vary in size from that of a pea to that of a walnut. They ulcerate sooner or later, and become eating and spreading sores, with ragged borders, and surrounded by hardened ridges of flesh, with a marked depression in the centre, from which large quantities of matter are discharged.

**FARCY CORDS.**

After farcy buds appear, there also may be seen long, straight, narrow ridges, as though a small rope lay beneath the skin. These farcy cords, as they are called, always run from a farcy bud to the nearest lymphatic gland, and are the lymphatic ducts or pipes, inflamed by the glanderous poison. They often become chains of farcy buds which develop in them, and which in turn ulcerate, and pursue the same course as the original farcy buds.

**DISINFECTION.**

Every stall or enclosure where a horse having glanders or farcy has stood, should be thoroughly disinfected, after the removal of the diseased animal.

Care should be taken that the hands be not inoculated by the virus contained in the matter left upon and in the manger, and upon the sides of the stall and on the floor. It is better that the hand should not come in contact with any part of the stall but that a short mop be used for washing.

There are many modes of cleansing and disinfecting, and many kinds of disinfecting agents that can be made use of. The most effectual agent is heat above 200° F. Tearing out and burning the wood work of a stall, and subjecting the iron work to the heat of burning wood, takes precedence of all other methods for absolute effectiveness. All the articles made use of upon and about the horse, like brushes, blankets, brooms, &c., should be destroyed by fire. Larger and better articles may be boiled for half an hour, when the form or texture will allow, or subjected to dry heat of an equal tem-

perature. If the stall is to be retained, the whole surface of every part should be thoroughly rubbed and scrubbed, with boiling water, by means of a mop with a short handle, for greater facility of use. The boiling water should be pressed into all the cracks and crevices, and used so freely that all the slimy and sticky matter will be dissolved and cooked in it.

Another method is to use copperas dissolved in boiling water. Three pounds to a pail full of water in which is also dissolved one-half pound of crude carbolic acid; or the copperas is quite effectual alone, but in either case the liquid should be used hot and in the same manner as the boiling water.

It is unnecessary to go into details respecting other modes of disinfecting, as the above are the cheapest, most easily performed, and sufficiently effective for all ordinary cases.

Lime washing should, however, as a last application to the entire surfaces of the stalls, follow either of the above methods.

Copies of the tract were left in parcels for gratuitous distribution, in a number of places of large resort, in the cities of Providence and Newport, and in the larger villages of Providence, Kent and other counties. They were also distributed in nearly every public stable, and blacksmith shop in the city of Providence and vicinity.

#### INSPECTION OF STABLES.

By vote of the Board, "the secretary was authorized, if he deemed it expedient, to cause an inspection to be made of any, or all of the public or private stables of the city of Providence, and vicinity."

The occurrence of several cases of glanders, brought to the notice of the Secretary, within the period of a few days during the second week in August, seemed to demand some action which should determine as far as possible, to what extent the disease was prevailing in the city, and vicinity.

The services of Constable C. H. Thurber, who has had a large experience with glandered horses, were secured.

It was not thought expedient to visit those larger stables which are under the constant supervision of a veterinary surgeon, nor the private stables of those who keep only first-class horses, and who call in the services of skilled veterinarians, upon the occurrence of any disease among their animals.

The instructions given the inspector were, that while stables of the character described in the preceding paragraph needed no attention, he should take especial pains to seek out and examine all stables and places where the disease would be more likely to gain access, or be harbored and perpetuated.

He was furnished with a blank book, in which he was to make a record of his work, giving the day of the week and month of the visit made, the location of the stables visited, the name of the owner or owners, the number of horses examined in each one, the general condition of the horses, the sanitary condition of the stable and surroundings.

The following report was received from Mr. Thurber upon the completion of his work.

PROVIDENCE, Oct. 27, 1879.

*Charles H. Fisher, M. D., Secretary of the State Board of Health:*

SIR:—In accordance with your instructions I have made as thorough an examination, as circumstances would permit, of the sanitary condition of the horses, stables and barns within the city, having special reference to the disease called Glanders and Farcy, and submit the following report, to wit:

Horses examined in stables.....	1578
Stables and barns visited.....	328
Horses found glandered or farcied, or both, and destroyed.....	6
Horses suspected to have the disease, isolated, and since discharged.....	8
Horses at present isolated.....	2
Barns in bad sanitary condition.....	33

Also not included in the above statement I have made daily examinations of team and hack horses found at the railroad station, and on the streets, and the horses of marketmen and others found standing on the bridges to the number of not less than five hundred additional.

Respectfully,

CHARLES H. THURBER.

The book of record is in the office of the Board, and can be seen by any person desiring an examination.

#### HOSPITAL FOR DISEASED HORSES.

At one of the meetings of the Board, a committee was appointed "to take into consideration the expediency of establishing a hospital for such diseased horses as were suspected of having glanders or



farcy," such horses to be retained and treated until further development should declare the nature of the disease.

While such an institution would undoubtedly be of considerable value in removing from the public, animals having the disease sufficiently advanced to communicate it, and therefore liable to infect other animals, if left in charge of persons not known to be careful and reliable, there are at the same time other considerations which, in the judgment of the committee, seemed to make the establishment of such an institution unadvisable at present.

#### PUBLIC WATERING TROUGHS.

Considerable complaint having been made to the Secretary, of the dangers apprehended of the infection of glanders being communicated to sound horses through the medium of the horse watering troughs in the city of Providence, it was resolved by the Board "to recommend to the Mayor and Board of Aldermen of the city of Providence, the consideration of the propriety of thoroughly cleansing and drawing off the water, *daily*, from the public horse watering places, as a means of diminishing the liability to infection from glandered horses having access to them."

This resolution was communicated to the Mayor, from whom the following reply was immediately received:

CITY OF PROVIDENCE, EXECUTIVE DEPARTMENT, }  
CITY HALL, August 23d, 1879. }

Hon. C. H. FISHER, M. D., Secretary, etc.

*Dear Sir:*—I have received the copy of the vote of the State Board of Health in relation to the cleansing of the public drinking troughs, and have transmitted the same to the board of water commissioners who will cause the work to be done.

Yours truly,

THOS. A. DOYLE, *Mayor*.

It is believed that a continuance of the practice of frequent cleansing of the drinking troughs as above described, would aid very materially in diminishing the number of glandered horses.

#### DETECTION OF GLANDERED HORSES.

The Secretary has had the aid during the year, as heretofore, of Dr. N. A. Fisher, General Agent of the Society for the Prevention of

Cruelty to Animals, whose attention to cases of disability or unfitness for labor of horses, by reason of age or disease, has brought him not unfrequently in contact with glanders. His services have been highly appreciated. The police of the city of Providence have also been quite prompt in the reporting of suspected cases, and Constable C. H. Thurber, local agent of the Society for the Prevention of Cruelty to Animals, already spoken of, has also rendered valuable service. The means of detection in the country towns and larger villages, are in the hands of persons who can render better service by having their names withheld.

As before stated, a very much larger number of suspected cases of glanders are reported, that are found free from that disease, than are affected with it, and much the largest proportion of the informers of such cases are persons outside of any agency employed.

#### DEATH RETURNS.

In order that a more correct and fuller record of the circumstances attending all the cases of death and burial of glandered horses might be kept, the Secretary prepared a "Return" which is designed to be filled out by the person who has charge of the burial of any such horse, and especially of any burial at the expense of the State. The returns have been made in all such cases, and may be examined by any person desiring to do so.

The Return is as follows : (See blank on the next page.)

# RETURN OF DEATH OF HORSE,

AFFECTED WITH GLANDERS OR FARCY.

STATE OF RHODE ISLAND.

1. Date of death ?.....	.....1879.
2. Died of disease ? or killed ? . . . . .	.....
3. Place of death?.....	.....
4. Date of burial?.....	.....1879.
5. Place of burial?.....	.....
6. Form of disease ?.....	.....
7. Duration of disease ?.....	.....
8. Color and Sex?.....	.....
9. Probable age? and condition? .....	.....
10. Name of owner?.....	.....
11. Place where kept?.....	.....
12. Stable public or private?.....	.....
13. By whom reported?.....	.....
14. By whom brought or taken? .....	.....
15. By whom buried? .....	.....
16. Buried at whose expense?... ..	.....

..... INFORMANT.

## DISPOSAL OF GLANDERED HORSES.

As in previous years persons having in possession horses affected with glanders, are frequently of impecunious means, and quite as often have too little feeling of responsibility, and are too indifferent to the welfare of the public, to take the animal to a proper place for burial, and perform that work in a proper manner. Therefore the arrangements heretofore made with Mr. W. E. Barnes, of Field's Point, for that purpose, have been continued, and his returns have been quite promptly sent in, and can at any time be inspected.

The number of cases of glanders, which have come to the knowledge of the Secretary, and been disposed of in this State, during the year 1879, is forty, of which thirty-three were buried by Mr. W. E. Barnes, and seven elsewhere and in different towns.

During the year 1878, there were in the eight months following the organization of the Board, twenty-five horses affected with glanders, which had died or been killed within the knowledge, or by the order of the Board or its agents. Previous to the organization of the Board, and in the same year there were eighteen which had come under the notice of Dr. N. A. Fisher, making forty-three in all.

It is not too much to say that the means of discovery of cases of this disease have been more complete during the past year than at any previous time.

The advent of any considerable number of horses into the State at any time, (with the exception of young horses brought in for sale,) is the occasion for an examination by a veterinary expert, and on one occasion during the year 1879, three horses were found glandered in a circus troupe by Dr. N. A. Fisher and Constable Thurber.

The following communication from Dr. N. A. Fisher, whose services have been previously alluded to, will sufficiently explain itself :

## R. I. SOCIETY FOR THE PREVENTION OF CRUELTY TO ANIMALS,

PROVIDENCE, January 3d, 1880.

*Charles H. Fisher, M. D., Secretary State Board of Health :*

SIR:—The following report includes all the cases of Glanders and Farcy that have come to the personal knowledge of the agents of this society during the past year, and all that have been reported to the State Board of Health, and as it is believed that the regulations of the Board, making it the duty of any person having knowledge of animals having this disease, to give prompt notice of the same to some member of the Board, has been generally complied with, it may be regarded as nearly correct.

The whole number of cases of Glanders and Farcy found in the State in the year ending January 1st, 1880, is forty, which is three less than in 1878, and seventy less than in 1877. Of these forty—all of which were horses—two died of the disease and thirty-eight were killed, six by their owners and thirty-two by direction of the Board. Thirty were found in the city, three in Johnston, two in Cranston, one in Scituate, one in East Providence, one in Lincoln and one in Pawtucket. Of those found in the city, six were in public stables, nineteen in private stables, three at the Saturday sales of old horses on the Cove lands, one of which was brought from Connecticut, and one from Massachusetts, and three were found with Bachelior & Doris' circus, which came into the State in July.

Numerous cases of animals suspected of having Glanders or Farcy have been examined, but the greater part were only catarrhal affections, which have been somewhat prevalent. Wherever there was any doubt about the nature of the disease, careful isolation was insisted on until all doubt was removed; and if the result proved that the suspicions were well founded, the animals were destroyed.

The judicious measures adopted by the State Board of Health have undoubtedly done much to prevent the spreading of the disease, and give assurance that the danger which has been so alarming will soon be entirely averted.

N. A. FISHER,

*General Agent R. I. Society for the Prevention of Cruelty to Animals.*

#### PLEURO-PNEUMONIA.

This is one of the most fatal of contagious diseases among cattle, and also one of the most to be dreaded, because of the rapidity of the communication of the disease from one animal to another. It may indeed be said to be more rapidly destructive of large numbers of cattle than any other, unless with the possible exception of the rinderpest or cattle plague.

During the year notices have been received from three localities in the State, where the disease was believed to prevail in limited numbers.

In neither instance was there any foundation for a reasonable conjecture even, that the disease was pleuro-pneumonia, had the parties any fair knowledge of the nature and characteristics of the disease.

It may be stated here, that the disease *never* occurs spontaneously, that *every case* is the result of contagion; an infection communicated from a previously diseased animal, and that it never occurs singly or in twos or threes only, where there are any other animals of the same kind to be affected.

Early in the year it prevailed largely in Brooklyn, N. Y., and vicinity, and many persons in Rhode Island became alarmed when any form of disease occurred among cattle, which seemed at all unusual.

In the month of March, a communication was received from Mayor Doyle, of Providence, in which it was stated "that he had been informed that there were and had been for some time in the city and vicinity, sick cows, the milk from which had been sold and used in the city with the knowledge of the State Board of Health." It was true a rumor had been circulated, that pleuro-pneumonia had broken out in two of the milk stables of some magnitude in the south part of the city. Sensational articles had appeared in some of the newspapers in relation to the diseased animals.

An examination was made by the Secretary, immediately upon the receipt of the first notice of suspected disease among the cows in those stables, without finding any evidence of disease of any kind whatever. Milk from different cows in both stables was taken, and by request of the Secretary subjected to analysis by the Milk Inspector of Providence, with the result of finding no abnormal constituents.

This disease is not likely to be brought into the State by western cattle, as it has never prevailed west of the Alleghanies.

The danger has been, and doubtless will continue to be from *blooded stock* brought from Europe or New York, or some one of the tier of Atlantic States, between New York and North Carolina.

The disease can never gain large headway in Rhode Island, with anything like timely notice having been given the State Board of Health.

During the year the Secretary has visited a considerable number of the larger milk stables of the city of Providence and vicinity, for the purpose of ascertaining what were the sources of diseased milk, if any such sources existed.

The result was a firm conviction that the stables from which the city of Providence is supplied with milk, are at least in regard to general condition and healthfulness of stock, equal to those supplying any city in the United States.

No reports of the supposed existence of any other contagious disease among the domestic animals of the State have been made, although not a few persons have made the inquiry, whether the spinal meningitis affecting a considerable number of horses throughout the State, was not contagious? and a fear has also been expressed that the Gourme or Horse-Pox, prevalent in some parts of Canada during the year, would be transmitted to Rhode Island. There is no evidence that the spinal disease is contagious, and the Gourme is not a disease of a character dangerous to life, but will have early attention if it becomes known in this locality.

## EXPENSES OF THE BOARD.

Paper and printing death returns, circulars, etc.....	\$66 51
Books, twine, wrappings, stationery, etc... ..	50 30
Postage stamps and postal cards.....	53 00
Expressage and telegrams.....	4 22
Electrotype plates, maps, etc., first annual report .....	30 00
Heating apparatus, fuel, cleaning, etc ..	30 60
Binding returns of births, wrappings, etc.....	14 40
Traveling expenses of members....	81 00
Copies of Sanitarian for correspondents.....	39 75
	<hr/> \$369 78

### *Cattle Commission,*

Paper and printing 5000 tracts (Glanders).....	\$31 04
Advertising.....	19 56
Examination of stables and veterinary fees.....	63 00
Transportation and services of agents, etc.....	17 35
Killing and burying 14 horses, June 1st to Dec. 31, 1878....	42 00
“ “ “ 20 “ Jan. 1 to Nov. 1, 1879.....	60 00
	<hr/> 232 95
Salary.....	\$1,200 00
	<hr/> \$1,802 73

The value of the stationery, stamps, desk material and utensils on hand, is about the same as at the time of making the previous report.

## BOOKS RECEIVED, 1879.

1	vol.	Rhode Island Registration Report for.....	1877
1	"	R. I. Manual from Secretary of State.....	1878-9
1	"	N. Y. Brooklyn, Report of Board of Health, from Dr. S. O. Meyers, 1878-4	
1	"	" " Dispensary Report " " " 1874-5-6	
1	"	Colorado, Second Report State Board of Health.....	1877
1	"	New Jersey " " " " " .....	1878
1	"	Conn., 8th Annual " City " " New Haven.....	1878
1	"	Illinois, " " " " " Chicago.....	1878
1	"	District of Columbia, Annual Report Board of Health.....	1878
1	"	N. J., Hudson County, " " " " .....	1878
1	"	Providence, Ordinances of the City.....	1875
1	"	" " " " " .....	1877
1	"	Report Surgeon-General, U. S. A.....	1878
1	"	" " " Marine Hospital Service.....	1876-7
2	"	Report Superintendent Insane Asylum, North Carolina.....	1878-9
1	"	Illinois State Board of Health, 1st Report.....	1878
1	"	Conn. " " " 1st " .....	1878
1	"	Kentucky " " " 1st " .....	1878
1	"	Wisconsin " " " 3d " .....	1878
1	"	Mass. " " " 10th " .....	1879
1	"	R. I. State Board of Education and Commissioner of Pub. Schools, 1878	
1	"	U. S. Reports, etc., National Board of Health.....	1879
1	"	Pennsylvania, Report of Board of Health.....	1878
1	"	Kentucky, 1st Report State Board of Health.....	1878
1	"	D. C., Report Commissioner of Agriculture, from Prof. Collier....	1878
1	"	Massachusetts, Report Board of Health, Boston .....	1879
2	"	U. S. Investigation of diseases of Swine and other Animals, from Agricultural Department.....	1879
1	"	Alabama, Transactions State Medical Association and State Board of Health.....	1879
1	"	N. Y., Annual Report Board of Health, City of New York.....	1874-5
22	"	R. I., City of Providence, Annual Registration Reports, from Dr. E. M. Snow.....	1856-1878
		U. S. Medical and Surg. History. War of the Rebellion, from Hon. B. T. Eames—	
1	"	" " " " Part 1st Medical—Volume.	
1	"	" " " " Part 1st—Surgical "	
1	"	" " " " Part 2d— " "	



- 1 vol. *Materia Medica*, Thayer, from Hon. Elisha Dyer, Jr.  
 6 " *R. I. Registration Reports* " " " ..... 1853-1858  
     By purchase—  
 1 vol. *Sanitary Examination Water*—Fox.  
 1 " *Hart's Manual*.  
 1 " *Qualitative Analysis*—Prof. Appleton.  
 1 " *Cameron's Hygiene*.  
 2 " *Fleming's Veterinary Science*.  
 1 " *Water Analysis*—Wanklyn.

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LIST OF CORRESPONDENTS.

1879.

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Dr. E. A. Angell,  
 " M. P. Arnold,  
 " Otis Bullock,  
 " A. B. Briggs,  
 " H. J. Bruce,  
 " G. L. Church,  
 " E. P. Clark,  
 " I. B. Cowen,  
 " H. C. Crandall,  
 " S. Clapp, \*  
 " J. H. Eldridge,  
 " D. M. Edwards,  
 " G. R. Fisher,

Dr. L. Forsyth,  
 " S. W. Francis,  
 " L. F. C. Garvin,  
 " Benjamin Greene;  
 " W. von Gottschalk,  
 " G. B. Haines,  
 " G. D. Hersey,  
 " G. W. Jenckes,  
 " A. A. Mann,  
 " J. M. Merchant,  
 " T. H. Mann,  
 " C. E. Maryott,

Dr. A. R. Matthews,  
 " R. F. Noyes,  
 " G. A. Pike,  
 " A. Potter,  
 " G. B. Peck, Jr.,  
 " F. H. Rankin,  
 " A. G. Sprague,  
 " I. W. Sawin,  
 " F. B. Smith,  
 " W. J. Smith,  
 " E. P. Stimson,  
 " G. F. S. White.

\* Deceased during the year.

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# ARTIFICIAL FEEDING OF INFANTS.

BY

OLIVER C. WIGGIN, M. D.,

PROVIDENCE, R. I.,

MEMBER OF THE STATE BOARD OF HEALTH.

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THE Trustees of the Fiske Fund, at the annual meeting of the Rhode Island Medical Society, held in Providence, June 11, 1879, announced that they had awarded a premium of two hundred dollars for the best Essay on "Artificial Feeding of Infants," to an Essay bearing the motto, "*Vivat infans*," and on breaking the seal of the accompanying packet, they found the author to be OLIVER C. WIGGIN, M. D., of Providence, R. I.

EDWARD T. CASWELL, M. D., Providence,	}	<i>Trustees.</i>
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CHARLES W. PARSONS, M. D., Providence,

*Secretary of the Trustees.*

## ARTIFICIAL FEEDING OF INFANTS.

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THE frequency with which it becomes necessary to take a child from the maternal breast before the proper time of weaning, renders the subject of artificial feeding of infants of great importance. Derangement of the digestive organs is the most fruitful cause of infant mortality; and though these derangements may not always be avoided under the most skilful management of diet, yet it must be acknowledged that the far greater portion of them results from the violation of the most simple laws of alimentation. Physicians are fully aware of the importance of this fact—more so, perhaps, than formerly—and they have made it so much a practical study that any one of them might write a valuable treatise on the subject. It is hardly expected to present anything here which will strike the average practitioner as being new. It is, however, interesting for the most experienced person to compare his own observations with those of his fellow-workers, while the younger student and the public at large, may find something of profit in the records of an experienced observer. Among the more intelligent portions of the community one finds much general knowledge pertaining to infant diet. Physicians have, for a long time, taken considerable pains to teach mothers and nurses something of the physiology of baby-hood. The kind of food found in use is oftener more nearly correct than the method of its preparation and administration. It would seem that a more minute knowledge as to the details of the *manner* of feeding, added to what is already popularly known respecting the materials of diet, would considerably lessen the evils of artificial feeding. In this direction something may be profitably said.

It is hardly practicable for the physician, in his daily rounds, to attempt to instruct mothers and nurses in all the physiological intricacies of digestion, absorption and assimilation, and of the distinctive characteristics of digestion in the infant, but something may be,

and should be, taught. Even a vague idea, on the part of an attendant, as to why she is required to carry out any special process, is better than none. Few persons are so dull as not to like to know the reason of what they are required to do, and it will often be found impossible to get some seemingly trivial manipulation carried out, for any length of time, without giving and repeating an accurate idea of what is desired to be accomplished. But, whatever may be thought of the attendant's knowledge of such things, there can be no question as to the physician's stand-point. Any attempt to correct the derangements of digestion without a full understanding of the special physiological function, or functions, at fault, must result in failure. This statement is not so trite as it might at first seem. It must be unsatisfactory in the extreme to offer advice for the alleviation of a train of evils without a comprehension of the causes which have led to them. The necessities of little dyspeptics are urgent; their suffering is generally very great, and not unfrequently fraught with danger. It is important to their comfort and safety that the physician, who is pretty surely, sooner or later, to be called to their aid, should take in at once the whole situation and be able to direct such corrections in diet as shall bring speedy relief. Only by close observation of the various derangements of digestion in children, and the effects of special articles of diet, and the manner of preparing and administering them, can one formulate his knowledge and be able, with any degree of certainty to suggest means of relief.

The conditions which unfit the mother for nursing her child are very numerous. These conditions afford an important field for investigation. It would be interesting, in this connection, to exhibit the causes which render the artificial feeding of infants necessary, but such considerations hardly seem to come within the scope of this paper. We shall consider the infant as cut off from its mother entirely—as living an independent existence. Nor does it seem necessary to enter into an elaborate description of the various processes of digestion. There are, however, a few distinctive characteristics of infant digestion which it may be well to consider briefly, since we have to keep them constantly in view in all our reasonings and practices upon artificial feeding. We start with the stern fact that the infant has been deprived, from some cause or other—it matters but little what—of its natural supply of food. It is thrown upon our hands to sustain and develop. How best to do this in harmony with nature's methods will be the simple inquiry of this essay.

Whatever is anatomically and physiologically distinctive in the digestive apparatus of the infant, is sufficiently obvious to all but the uninstructed. In the first place, there are no teeth, and simply for the reason that there is no use for them, and because they would be the source of pain and danger to the mother in the natural process of nursing. On the other hand, the toothless gums are a sign of infancy, affording a more accurate measure of that period of human life than any other. With one or two exceptions, hereafter to be considered, a child is to be regarded an infant until it has teeth. Incidentally, also, this definition defines the scope of the subject under consideration. Until solid food can be minutely divided by mastication, it should be conveyed to the stomach in a state of solution or nearly so.

Another peculiarity of the infant is the undeveloped state of the salivary glands. Its natural diet of breast milk being free from amylaceous substances, there is no call for saliva. As one important office of saliva is to start the sugar-forming process in starch, the absence of such fluid would indicate that starchy foods should be withheld until the function of the salivary glands be established. This is not accomplished, to any considerable extent before the age of three months, but after this age, the process of saliva secretion progresses with comparative rapidity.

The stomach of the infant also presents some important peculiarities. It is more tubular in shape than in the adult, being less full in its larger curvature, and consequently narrower at the cardiac end. Its position is more nearly vertical, partly owing to its shape and partly to the relatively larger size of the liver, which projects to the left of the median line, pushing the pyloric end of the stomach with it. This vertical position of the stomach is favorable to the rapid emptying of its contents, not only into the intestinal tract through its outlet, but also through its inlet by the act of vomiting. The readiness with which the infant vomits is the natural safeguard against indigestible materials and an over-charged stomach. But by far the most important fact resulting from this tubular shape of the stomach is the greatly reduced number of pepsine forming glands. These glands are situated in the larger or cardiac end of the stomach, and they are less numerous in proportion to the diminution in size of that portion of the organ. This would indicate a diminished power of digestion of nitrogenous solids.

The pancreatic juice is deficient in the element which changes starch into sugar. This office of the pancreas is delayed even later than the

same office of the salivary glands. Its emulsifying action, however, appears to be in full operation from the first, for the quantity of fat which a healthy infant can digest is considerable.

The intestinal canal of the infant differs in one important function from that of the adult. The glands which secrete the digestive fluids in the adult are not developed to any considerable extent before dentition is pretty well advanced. Hence, any solid particles of food which may pass through the stomach undissolved, continue their course through the intestines without material change. This deficiency of intestinal juices increases the difficulties of artificial feeding. In fact, it constitutes the chief distinction between infancy and adult life, as far as alimentation is concerned. The mucus glands of the intestines, as well as those throughout the digestive apparatus, are very active in infancy, and slight irritations, in the form of indigestible substances, and acrid products of fermentation, produce an abnormal secretion of mucus amounting to disease. This latter circumstance is also one of the great obstacles in the management of diet. Absorption of the liquid contents of the intestines is very active in the healthy child, but is liable to interruptions from much slighter causes than in adult life.

These constitute the chief distinctions of infantile digestion. Their bearing upon the management of diet will be considered more fully in connection with special directions for feeding.

There are two great problems of alimentation, namely, construction and force-production. The former is universally recognized as of equal importance in all periods of life; the latter, though equally obvious, and much more conspicuous in its manifestations, is too often ignored in the care of infants. The most patent fact to the popular mind, in connection with artificial feeding, is the relation between supply and demand. Every one understands that the human frame is made up of certain organic and inorganic substances, combined, in mysterious ways, into bone, muscle, nerve, sinews and other tissues, and that the maintenance and growth of these are directly dependent upon the supply of the same elements, in the same or in different combinations, in materials known as food. This has been called the vegetative view of construction; for it is a law equally applicable to vegetable and animal life. It has been much the custom to regard the infant as little more than a vegetative creature—certainly much more nearly allied to vegetable life than the adult. He is generally put lower in the scale of animal life than the young of

brute species, since they earlier acquire the power for a larger muscular activity. This conception has given rise to grave defects in the feeding of infants. The great demand in the infant economy for the force-producing elements of food is vastly underrated. The usual reasoning seems to be that the infant is a growing little animal, and, in comparison with the young of other species, he is helpless and quiescent. He must, therefore, be supplied largely with the nitrogenous, but more sparingly with the non-nitrogenous elements, while the inorganic materials, so essential to the metamorphoses of tissue-building, are sometimes quite overlooked.

The manifestations of life involve many activities other than those of construction. Consider, for a moment, the relative weight of the internal viscera as compared with the rest of the body; consider the functions they have to perform of secretion, excretion, assimilation, and many other molecular changes constantly taking place in the body; consider the involuntary muscular activity of the digestive apparatus, of the heart and other circulatory organs, of the respiratory movements; consider, moreover, the amount of exercise, both active and passive, a baby gets in the acts of crying, laughing, cooing, kicking and wriggling, and the perpetual bouncing, shaking and trotting by attendants; consider, still further, the vast demand upon the nervous system, not only upon the brain and spinal cord, but upon the peripheral nerves, in the offices which they fill in all the functions just enumerated. What a vast expenditure of force! What a demand for the hydro-carbons and the carbo-hydrates! In short, any practice of feeding which ignores to any considerable extent, the fact that the infant has a nervous and a muscular system must be defective.

The dynamic relations of infant food are not sufficiently appreciated. It has been estimated that the adult body is capable of turning one-fifth of the power of its food into the equivalent of work. (Pavy.) It may be questioned whether the demand for the force-producing elements of food of the infant, whose movements are largely beyond the control of its own will, is not fully equal, proportionately, to that of the adult whose activities are mainly voluntary. The natural food of infants is in a form to give the greatest possible results both of tissue-building and force-production. It can be more completely utilized than is possible with the food of adults. This is evident from the fact that the quantity of unoxidized matter (urea) eliminated from the system when supplied with mother's milk is much less in proportion than when a mixed diet is used. It used to be supposed that the exact



expenditure of muscular force could be measured by estimating the quantity of urea eliminated. I have heard it argued that since babies excrete but little urea, there can be but little waste of tissue from the expenditure of force. It is well known that the quantity of urea excreted depends more upon the elimination of unoxidized materials of nutrition which have never been organized in the body, than upon the waste products incident to the destruction of tissues. It is not proved that urea bears any known ratio to muscular work or to molecular changes in the nerve-tissues. The small quantity of urea found in the excretions of infants must be attributed, then, to the complete utilization of the nitrogenous elements of their natural diet in the process of nutrition.

This is not the place to enter into a full discussion of the relation of diet to force-production; but it may be briefly stated, while urging the attention to the subject, that the production of muscular and nervous force is attributed to the oxidation of various organic substances taken as food, the chief among these being starch, sugar, dextrine and the fats. The value of any alimentary substance, as a force-producing agent, depends upon the amount of oxygen appropriated in the process of oxidation. It is found that fat has the highest capacity for oxidation of any substance used as food, and that sugar, though much lower in the scale of oxidizable substances, still has a considerable capacity for the consumption of oxygen in combustion. One of the products of oxidation is carbonic acid, which is eliminated chiefly through the lungs. This product, if accurately estimated, should furnish a just measure of the force produced. It can hardly be doubted that could the carbonic acid eliminated by the rapid respiration of the infant be collected, the product would exhibit an expenditure of force far greater than is generally believed. And, referring to food again, we should expect to find in the natural pabulum of the baby some indication in its composition of the offices it has to fulfil; and this we do find. We find that the combined percentages of sugar and fat stand to caseine (nitrogenous element) as two to one.

It is desirable that the artificial food of the infant simulate, as nearly as possible, its own natural diet. The best practical resource we have is found in the milk of the cow. It is generally possible, by one modification or other, to suit cow's milk to the digestive peculiarities of the child. If it were not for this resource, or for the milk of some other animal, infant mortality would be much greater than it now is. As a rule the quantity of fat (cream) and

sugar in cow's milk furnishes no obstacle to digestion. On the contrary, any considerable diminution of these materials is a common cause of indigestion, as will be shown hereafter. It is the caseine of cow's milk which produces the greatest amount of disturbance in digestion. It is not only too great in quantity, but it coagulates rapidly and in large masses, thus forming heavy curds, on which the digestive fluids of the stomach act very slowly. It is, therefore, necessary, during the first few months of life to remove a portion of the caseine, or, what amounts to the same thing, to dilute the milk with water. The digestion of caseine is facilitated by three conditions; these are, (1) the presence of a relatively large percentage of fluid in the stomach, (2) its coagulation into small, flakey masses, and (3) the presence of a considerable portion of cream. If the gastric juice is not well diluted it acts rapidly upon the caseine and precipitates it into large curds, which will irritate the stomach and will be ejected by vomiting, or they will pass through the intestine undigested and produce worse effects. It was just said, while pointing out some of the peculiarities of the infant's stomach, that the quantity of pepsine secreted is small in comparison with that of the adult. It is quite sufficient, however, for the purpose of dissolving the caseine of human milk, which is small in quantity (i. e. the milk is more watery), and which has the property of being precipitated in small flakes. But if the quantity of caseine is large (as in cow's milk), the portion first dissolved is sufficient to appropriate the pepsine to a degree to stop further action until more pepsine is secreted or more fluid is added. That is to say, the dissolving power of the pepsine already secreted is not exhausted, but it is simply not in a state of sufficient fluidity to act upon the food. And besides, the portion of food already dissolved is not sufficiently liquid to admit of absorption into the waiting blood vessels. A large portion of the pepsine is manufactured by the peptic glands from nutritive materials, absorbed directly from the stomach at the time of digestion. The first resource these glands have, when the stomach receives milk, is the sugar held in solution, which is immediately available on the precipitation of the caseine. So long as the glands receive the materials to form pepsine, and the contents of the stomach are sufficiently fluid to favor digestion and absorption, the process of dissolving caseine goes on without interruption.

The importance of caseine being in a state of minute sub-division is obvious enough without explanation. This is generally effected readily enough by maintaining the proper proportion of water in the

milk, otherwise it is necessary to resort to other means, which will be explained in another place.

There is one unfortunate circumstance connected with the digestion of caseine which often works great mischief. It is liable to become precipitated in the form of large and tough curds by an excessively acid condition of the fluids of the stomach—not so much by the acids of the gastric juice proper, as by the products of acid decomposition of other elements of food. This result sometimes happens with the use of human milk, but it is very much more liable to attend the use of cow's milk. It is greatly to be regretted, and it is to be prevented as constantly as possible. This precipitated caseine is much more tough in its texture, and consequently more difficult of digestion than the usual flakey coagululum. In fact, it cannot be dissolved in any of the digestive fluids of the infant. It is either vomited violently or it passes through the bowels, growing constantly harder and more indigestible, causing a vast amount of pain and other disturbance. This is the kind of curd seen in those cases of explosive vomiting, attended with an excessively acid condition, and which, in warm weather, is often the precursor of *cholera infantum*. So long as the pepsine and acid of the stomach preserve a proper proportion to each other, or when excessive acidity is prevented by the presence of an alkali, this massive precipitation of caseine cannot take place. Of course the vomiting above referred to is quite a different phenomenon from the regurgitation, or mild vomiting, following feeding, which results from an over-replete stomach.

It was just remarked that this unhealthful acidity of the gastric fluids is due to the products of decomposition and not to the secreted acid of gastric juice. Excessive acidity is due to slow digestion. The *modus operandi* of this acid formation appears to be something like this. The mucus glands are abnormally active in this condition, and the mucus secreted readily takes on a fermentive process, resulting in a decomposition of the sugar and the chlorides of the milk, thus producing lactic, acetic and chlorohydric acids. Another source of acid is the precipitated caseine just described. If it remains long in the stomach it undergoes decomposition rather than digestion, and the product is of the most irritating nature. It seems to act upon the digestive system of a baby like a virulent poison. Its effect is about the same whether the putrefaction is commenced in the stomach or out of it. How often we see a child thrown into the most painful vomiting and diarrhoea from nibbling a crumb of cheese or from drinking milk in which the putrefactive process has begun.

In beginning the feeding of a new-born infant it is always safer to start with a relative deficiency of caseine than to run the risk of upsetting the stomach with an excess. The first week's feeding often decides the fate of the infant. The digestive apparatus often receives, during that time, an amount of disturbance from which it never recovers. It is well to begin a day or two after birth with one part of milk to two parts of water, and add the cream from a quantity of milk equal to that of the water added. To this should also be added four grains of the phosphate and chloride salts, and forty grains of the sugar of milk to each two ounces of water added. In other words, remove two-thirds of the caseine from cow's milk, and restore sufficiently the fat, sugar and salts. The mineral constituents of milk may be imitated nearly enough for practical purposes by an artificial preparation. It is desirable to have an available supply of artificial salts of milk for prescribing. The natural sugar of milk is also more easily digested, and consequently more desirable, than cane sugar. For the sake of convenience and accuracy in the hands of unskilled attendants, the salts and sugar of milk may be combined in the proportions in which they exist in milk. A pound of ash from an average quality of human milk would contain

Chloride of sodium, . . . . .	298 grains,
Chloride of potassium, . . . . .	1701 "
Carbonate of soda, . . . . .	52 "
Carbonate of lime, . . . . .	71 "
Phosphate of lime, . . . . .	2970 "
Phosphate of magnesia, . . . . .	520 "
Phosphate of soda, . . . . .	25 "
Phosphate of iron, . . . . .	52 "
Sulphate of soda, . . . . .	71 "
<hr/>	
Total, . . . . .	5760 grains.

Milk contains sugar in the proportion of 7.40 parts to one part of mineral matter, and, for the sake of convenience in dispensing, one pound of the salts may be thoroughly mixed with seven and one-half pounds of the sugar. Two ounces of milk contain about four grains of mineral matter and forty grains of sugar. This quantity will fill a teaspoon even full. Now in practice this mixture may be designated in the family as the "baby's sugar," or the "baby's salt." Suppose we wish an infant to have three ounces of food for each meal, it

is very simple to say to the attendant—Take four tablespoonfuls of hot water, two tablespoonfuls of milk, one teaspoonful of cream and one teaspoonful of the “baby’s sugar.” The hot water will generally be found sufficient to heat the milk and nursing-bottle to the temperature of the body, or to “blood heat.” The food should never be fed cold, and it is better to feed it from a nursing bottle. The act of nursing favors the secretion of digestive fluids. It is in accordance with nature’s method.

Robbing milk of a part of all its nutritive elements must tell disastrously upon the infant feeding upon it. A child may need three pints of milk each twenty-four hours to properly nourish it. If, in order to dilute the caseine, two parts of water are added to one of milk, it must either take a daily quantity of nine pints of the mixture, or suffer for the want of proper nourishment in taking a less quantity. At the outset we simply wish to give less caseine, but we cannot afford to do without the sugar, and cream, and salines. We should like to confine the bulk of food to three pints, losing no essential element of nutrition in the attempt to get rid of a portion of one of the least digestible elements. In three pints of a mixture containing two-thirds water, we get but one pint of pure milk, which is not enough to answer the demands of the infant. We must, therefore, restore the sugar and fat, as indicated.

An infant fed upon weakly diluted milk is not only insufficiently nourished, but it is liable to derangements of the stomach and bowels. It may as well be said here, that the quality of milk in use should receive strict attention. If it is proposed to water milk, it must be proved that it has not already been watered before reaching the consumer. It is of vast importance to the baby that its milk be not twice diluted. This is no imaginary danger. Milk may be found in many families every day vitiated by this mode of adulteration.

An insufficient supply of sugar in milk is a common cause of constipation in babies. Sugar is an important factor in the rapid digestion of caseine, as has been partially explained. In the first instance, it furnishes material for the elaboration of pepsine in the peptic glands; and secondly, a portion of it is decomposed into lactic acid, a certain quantity of which is conducive to digestion, by increasing the acidity of the gastric juice. Thus the digested food is passed rapidly out of the stomach before there has been time for an excessive acid decomposition, and the intestines are stimulated by this rapid supply to an increased peristaltic action. More remotely, also,

the sugar furnishes an important oxidizable element in the general system thus supplying the force required by the involuntary muscles of the intestines. While sugar must be regarded an important element in the first stages of digestion, it is also noticeable that an excess of it tends to a greatly increased acidity of all the digestive fluids, thus producing the very evils we would avoid. This is one of the difficulties attending the use of cane sugar, and when this is used instead of milk sugar, as is generally the case, the infant's power of digesting it must be determined by experiment. The capacity of infants in this respect differs very materially.

The immediate effect of fat upon the digestion of caseine is not readily explained. Its mechanical effect is of some importance no doubt. The oil globules are intimately incorporated in the coagulum of caseine, and do something towards rendering it more easily disintegrated. It is possible that fat performs some office in connection with the phosphates held in solution or suspension in the caseine, and which are set free in the stomach to play an important part, with other salines of milk, in the elaboration of the acid elements of gastric juice. Oil has the property of dissolving free phosphorus to a considerable degree, and of appropriating the phosphate and alkaline salts in the process of being emulsified. It is true this process is carried on at a later stage of digestion in the intestines, but the reorganization of the salts commences in the stomach. But, whatever its method of operation, fat certainly renders a larger amount of caseine digestible. It will often be found in practice that the addition of a little more cream to the baby's food will correct any mild indigestion of caseine. At the age of several months, when the child is feeding on nearly pure milk, this observation becomes of considerable importance. Much more cream can be digested than is popularly supposed. We often hear the complaint of the nurse that the milk in use is too "rich"—"it does not agree with the baby." By the term "rich" is almost always meant too much cream. Generally, in such cases, it will be found that the caseine is greatly in excess of the cream. As a shrewd farmer once expressed it, "there is more danger in the bottom of the milk-can than in the top." Within proper limits, the fat of milk will afford no disturbance of digestion unless there is a marked deficiency in the natural mineral constituents of the food. Exceptions will be met with, and now and then an infant will be found unable to digest much fat, just as in adults we meet with the same peculiarity. A little intelligent experimenting will reveal the facts of the case.

It is not necessary to discuss here the part which the fat of milk plays in nutrition. Its importance as a heat-making and force-producing agent, and the office it fills in cell-building and many other molecular changes necessary to the well-being of the body, is universally recognized.

Allusion has been made to the importance of restoring the mineral matter to diluted milk. Of all the errors of artificial feeding, the omission of the various salines which enter into the structure of the body may be considered the most common and the most serious. A large proportion of the vices of digestion, absorption and assimilation, may be traced to this neglect. When we consider how universally the salines are distributed through every solid and fluid of the body, it may be regarded almost a wonder how they become so generally overlooked as a factor of alimentation. From the moment they enter the stomach to the time they are eliminated from the system through the various excretions, they never cease to perform some important office. It would require a small treatise to follow them through the entire *rôle* they play in the animal economy. They are associated with the performance of every function of the body, whether of digestion, absorption or assimilation, whether of secretion or excretion, of endosmosis or exosmosis, of constructive or destructive metamorphosis. It is proposed here simply to point out some of the evils, chiefly to digestion, resulting from their omission from the infant's diet.

The important mineral constituents of milk are chlorine, phosphoric acid and (sparingly) sulphuric acid, in combination with soda, potash, lime, magnesia and iron. Loosley speaking, these may be classified into two groups, designated as the chlorine salts and the phosphate salts—the first group comprising chlorides of sodium and potassium; the second, phosphates of lime magnesia, soda and iron. Whether these combinations represent the precise mode of arrangement under which the salines exist in milk cannot be definitely stated, of course; for the process of incineration employed in their chemical analysis may effect rearrangements of some of the elements and produce new compounds. Happily, however, the several organs of the body find themselves able to appropriate them as they are presented, and of elaborating from them such materials as they need.

Although a proper degree of acidity is necessary to the action of gastric juice, it does not appear that its efficiency depends upon any one particular acid for its digestive properties. Lactic acid is now generally regarded as the free acid of gastric juice, but there is also

present, at the time of digestion, hydrochloric acid and the acid phosphate of lime. Their united presence is suggestive of use; and, while it is safe to say that digestion might go on measurably well under the office of either one alone, it is fair to conclude that their combined action best accomplishes the process.

The use of lactic acid in digestion has been pointed out while speaking of milk sugar. No less importance to the proper formation of gastric juice, and to rapid digestion, is the presence, in abundant supply, of the salines of milk. The chlorides and the phosphates begin their offices as soon as they reach the stomach. The chlorides furnish the chlorine for the formation, with hydrogen, of chlorohydric acid; the phosphate of lime contains the elements for the acid phosphate. Just what the chemical reactions are between these several salts, and how they are effected, is not known. What was said of the manner in which lactic acid acts in promoting digestion and increasing the peristaltic action of the intestines, can be said with equal truth of the other acids of gastric juice. Moreover the process of secretion of *all* the digestive fluids—gastric, pancreatic, hepatic and intestinal—depends indirectly upon the mineral ingredients of food. Slow digestion in babies is almost always attended with constipation. As was before pointed out, the proper stimulus of the peristaltic movements of the intestines is a rapid supply of the well-digested contents of the stomach. If digestion be slow, there is time for an excessive formation of acids, not only the normal acids, but also of the accidental and irritating acetic and butyric acids. If these are passed into the intestines in greater quantity than can be neutralized by the alkaline fluids there found, there will result an acid state of the bowels, and the infant will have an opposite condition—diarrhœa.

The alkaline reaction of the pancreatic juice, as of all the fluids secreted by the intestines and liver, depends upon the salines furnished through the blood to the organs secreting them. If there is an insufficient supply of these materials, in the food, there will be a deficiency in the secretion of the alkaline juices, and the neutralizing capacity of these fluids will be lessened accordingly. The result will be precisely what it is when an excessive quantity of acid is received from the stomach. So, from the same error in diet, we may get alternate constipation and diarrhœa, according to the quantity and quality of food administered.

It is hardly necessary to say, while pointing out the evils of an insufficient supply of mineral matter, that an excess of these same ma-



terials may result injuriously. Osmosis is a constant condition of normal cell-life. Transudation in and out through the walls of the cells depends upon a saline condition of the fluids to be transmitted. If this saline condition be excessive, transudation is too rapid, and before there has been time for the cells to appropriate the constructive elements of the nutritive juices they are poured off through the excretory organs—chiefly by the intestines—and we have, as a result, a wasting diarrhœa. This is an accident, however, which but seldom attends artificial feeding, for the quantity of salts is oftener defective than excessive.

Of all the omissions of the mineral ingredients of food, none has seemed to me so common and inexplicable as the omission of any potash salt whatever. If reference is made to the percentages of the different salts of milk, the large proportion of potash will be very noticeable. If, in nature's typical food, potash appears to be so important an ingredient, how can any artificial food of the infant be deprived of it without serious effects? Soda is generally supplied in abundance—too often in excess—in the form of chloride of sodium (common salt), and more rarely, in the practice of some, in the form of phosphate of soda. Important as this element is, it can never fill the office of potash in the living system. Their close alliance in chemical properties does not make them equivalents in their physiological offices. That each of these minerals has a specific office is evident enough from the special way in which they are distributed. "Thus, in the blood—and here the circumstances are of the most favorable nature for an equal distribution of saline matter, if a special appropriating action were not in operation—it is found that phosphates and potash salts predominate in the corpuscles, and chlorides and soda salt in the plasma around. Again, as regards the distribution of potash and soda generally, it is noticeable that the former is the alkali belonging particularly to the formed tissues, the latter to the infiltrating fluids." (Pavy.)

Of the formed tissues the muscles and the skin appear to suffer most from a deficiency of potash in the diet. It will sometimes be found that the weak, flabby muscles of an ill-fed infant will take on a more healthy nutrition under the use of certain potash salts added to milk or other food, while some of the cutaneous eruptions of the scalp and other parts of the body, are very speedily cured by their use. It has always seemed to me that the craving which babies of a few months of age almost uniformly manifest for potatoes over other

vegetable diet is due largely to the great percentage of potash contained in them.

The bare mention here made of the importance of the mineral materials of food, is for the purpose of calling general attention to the subject rather than for any exhaustive explanation of what is known and acknowledged by all physiologists.

We return now to the general diet of the infant. It is well to begin the feeding of cow's milk considerably diluted, with the cream, sugar and salts restored, as has already been explained. A new-born infant will require three to four ounces of a mixture containing one part milk to two parts water, every two hours. The proportion of milk and the quantity of food should be increased according to the digestive powers of the child, irrespective of age, feeling the way along carefully. The food should be prepared anew at the time of feeding, and not in quantity for the day. Milk decomposes rapidly after it has been watered, particularly in warm weather. In proportion as the milk is increased the added elements should be diminished. It will generally be found practicable to feed a healthy vigorous baby of five months of age upon clear milk — sometimes at an earlier age. It is desirable to get the child on a pure milk diet as soon as possible.

The value of "one cow's milk," which has been so generally considered desirable, is no doubt greatly over-estimated. Were the supply never so desirable it would be difficult to procure it. Few persons in cities keep a cow. The people are dependent upon the honesty and carefulness of the milkman. They do not understand the amount of watchfulness required to insure a uniform quality of milk from one cow. In fact it is well nigh impossible. It involves the system of feeding and the general care of the animal, as well as the after management of her milk, all of which must be delegated to hired help. The milk of any single cow must be much more variable in quality than the mixed product of an entire herd. Any accident of feeding, or any other condition modifying the quality of one cow's milk, would not materially change the quality of the mixed product of an entire dairy, whereas such accident might modify one cow's milk to a degree to prove injurious, or even fatal, to an infant feeding upon it. Under any ordinary management the entire yield of any one cow may be lost for one day, and generally, it is safe to say, the accident will not be reported to the customer taking the milk. The annoyance and danger of such accidents are sufficiently frequent to render the practice in question undesirable. A pure, sweet and rich

milk from a well-managed dairy is all we need demand, and we should be thankful for that. Those who insist on the use of milk from one animal would do better to use goat's milk. This will prove uniformly satisfactory. The goat should be kept on the premises where she can be milked at the time the child needs feeding, and the milk given warm and fresh from the udder. She makes an excellent step-mother. Her milk contains less of caseine and more of sugar and of salts than cow's milk, and moreover the salts are richer in phosphates than those from any other kind of milk. A sample of goat's milk which I analyzed last summer contained—

Caseine, . . . . .	3.50
Fat, . . . . .	4.10
Sugar, . . . . .	6.00
Salts, . . . . .	.70
Water, . . . . .	85.70

This milk was fed diluted with water in the proportion of one part water to four parts milk. After three months it was given clear as it came from the animal. The large percentages of lactine and of salts in goats milk have never in my experience proved any disadvantage.

Condensed milk sometimes proves very useful. Its use is not followed by very uniform success. The large amount of cane sugar which it contains furnishes an obstacle to digestion not easy to overcome completely. Still, in a few instances, I have found it to agree with the stomach when nothing else would, and apparently save the life of the child. For some cause the Swiss milk appears to be the most readily digested. It is to be regretted that some caution is necessary even in the use of condensed milk. It is generally thought that condensed milk cannot deteriorate while hermetically sealed. This is a mistake. It certainly does undergo some kind of deleterious change if exposed for a long time to the direct rays of the sun. This has happened several times under my own observation to samples which had been exposed in shop windows. In one instance the fat had partially decomposed into butyric acid. The sample was taken from the show-window of a shop where the summer sun had been pouring in upon it for a considerable length of time. In very large cities, where it is impossible for the masses to get fresh and pure milk, condensed milk must supply a great need.

When an infant's stomach has become completely incapacitated, from mismanagement or other cause, for digesting milk, it is well to

change the food for a short time—sometimes several days—until that organ has had sufficient rest to perform its regular office. During this interval of rest, rice-water and cream may be given in the proportion of five parts of the former to one part of the latter, and sweetened slightly with sugar of milk. Or, if desired, arrowroot may be used instead of rice water. It should be boiled until thoroughly hydrated, and made very dilute. Cream and sugar should be added as with the rice-water. These liquids should be fed often and in minute quantities—a few teaspoonfuls every hour. They are not foods in any important sense, and they should not be continued beyond a few days. If, from any cause, it should appear necessary to continue their use beyond a week, it is better to add teaspoonful doses of beef-juice from a fresh roast or from steak. At the same time a little rennet whey will often prove of service. In fact, the whey will often prove serviceable in connection with other forms of diet, from the pepsine contained in it.

On resuming a more substantial diet—and this should be done as soon as the circumstances will admit—the same caution should be observed as in the commencement with a new-born infant. It will occasionally happen that the diluted milk diet first described will not be tolerated by the stomach, and it will be found that some other modification of milk will suit better. As regards the physician's connection with such cases, i. e., when the little dyspeptic has actually become a patient, it will generally be found that various expedients have been tried by the mother, nurse and neighbors, and the baby has meantime attained about the age of three months. This is the age at which it will begin the digestion of some amylaceous substance tolerably well. When this can be borne, it is, no doubt, an aid to the digestion of caseine. The aid is chiefly mechanical. Any substance which causes caseine to coagulate in a state of minute sub-division aids its digestibility, inasmuch as it is now in a condition to be acted upon rapidly by the gastric juice. A slight modification of a diet recommended by Drs. Meigs and Pepper of Philadelphia (*Diseases of Children*,) is one I have used with the greatest satisfaction. The formula is:—

Milk, . . . . .	One pint.
Water, . . . . .	One quart.
Arrowroot, . . . . .	Two teaspoonfuls.
Gelatine, . . . . .	One teaspoonful.
Cream, . . . . .	Three tablespoonfuls.
"Salts of Milk," . . . . .	One even teaspoonful.
Sugar of Milk, . . . . .	Four tablespoonfuls.

Boil the arrowroot in the water till thoroughly hydrated (till it is transparent), dissolve the gelatine and sugar in the same, add the milk, and scald, adding the salts and cream after the food is taken from the fire. This mixture should be kept in the ice chest, and a quantity sufficient for one feeding warmed over as required. The vessel in which the food is cooked should not be placed directly in contact with the fire for fear of scorching. It may be placed in another vessel partly filled with water. I have never found any other food so uniformly successful, after the stomach has once been thoroughly deranged. If given in quantity and at intervals suited to the child, *and adhered to*, it will seldom fail to have the desired effect. It is important to adhere in a reasonable degree, to some system of diet. It is bad practice to change the food every two or three days in hopes of finding something better suited to the case. This practice alone would be sufficient to derange the stomach of a healthy infant. Indeed, this is often found to be the sole cause of the trouble, in artificial feeding. The "salts of milk" used in the formula have already been sufficiently explained. If the sugar of milk seems objectionable on the ground of expense or trouble, cane sugar can be used sparingly, and a small pinch (say three grains) of the salts added to each meal.

If possible, milk, in some proportion, should enter into the diet of the infant. In all cases, before abandoning its use, it should be ascertained beyond a doubt that it is really the milk itself which is the disturbing element. There should be a thorough investigation of the child's general management. Probably no function of the body is more sensitive to disturbing influences from without than that of secretion of gastric juice. Let every untoward circumstance be well canvassed. Many inquiries will suggest themselves to the careful observer. Is there sufficient cleanliness observed in all the details of feeding? is the baby over fed? is he too often over-fatigued? are there errors in bathing? is he kept warm enough? is he prostrated by heat? are there hereditary tendencies to dyspepsia? are there constitutional vices, such as scrofula, syphilis, or tuberculosis? These are some of the many relations affecting digestion, all of which must be kept constantly in mind.

Cleanliness in every detail of feeding is of the first importance. A sour nursing-bottle, or milk-can, or other utensil will start the fermenting and putrefactive process in milk very rapidly. Milk thus tainted is certain to upset the stomach. Many very young infants are kept in constant ill health from this cause.

Over-feeding is the most common of all the causes of indigestion. It consists either in giving too great a quantity for each meal or in feeding a less quantity at too frequent intervals. The food itself may be perfectly adapted to the child's powers of digestion, but, through carelessness or ignorance in administering the proper quantity, the digestive organs are kept constantly at work. It is only a question of how long they can endure such overtaxing. An infant which is fed every two hours should be through digesting in one hour, leaving the other half of the interval for rest. Or rather the stomach should be empty for that length of time. Intestinal digestion will be going on more continuously, of course. Children fed at longer intervals do not need fully one half the period for rest, perhaps, but the stomach should be empty one hour, at least, of each interval. An over-fed infant is in a state of constant malaise. It cries fitfully, and worries continuously; it seizes with avidity everything presented to it in the form of food. This habit is, in the minds of the attendants, a sure indication of hunger. In all discomforts of digestion, short of severe pain, babies are notoriously ravenous. It is difficult to convince their attendants of the true condition of things. "The baby is half starved," they say, which may or may not be true—very likely it is true, if insufficient food has been digested to nourish the body, but he will continue to starve until the stomach can be brought into a condition to prepare food for absorption. Directions for feeding should always be precise as to kind, quantity, frequency of feeding and the method of preparation. Attendants should be made to understand that the suitability of food depends as much upon the completeness with which it is digested and absorbed as upon its nutritive value *per se*—that the child is nourished by the quantity of food it appropriates, and not necessarily by the quantity taken into the stomach.

One very common cause of over-feeding is thirst. It does not always occur to the mind of the nurse that a baby whose diet consists exclusively of liquids may often be thirsty. Children often cry from thirst when it is supposed they are hungry. This most often happens in the night. The bottle is offered, which is seized with avidity, and thirst is quenched for the time being, but the already overloaded stomach has thrust upon it an additional burden, when a little water would better answer the requirements of the case. A child that may require but a moderate amount of food, may, nevertheless, require considerable liquid; and the peculiarity continues on through life. And besides, over-feeding itself generally induces thirst. Cold water is the

most refreshing and acceptable drink to the child, and unless some special condition of the system interdicts its use, it should not be denied.

There is the utmost importance of observing the very first indications of indigestion in the baby. Sometimes he will be worrisome, cry fretfully and writhe uncomfortably; he vomits solid curds, or belches sour smelling gasses; his belly feels hard and distended with "wind;" there may be slight looseness of the bowels, the dejections usually containing numerous undigested masses of caseine; he starts and turns in his sleep, bites upon his gums and draws up the muscles of his face as if about to cry or to laugh; his cheeks have large red patches, and he seems feverish at times, or perhaps he perspires too profusely. These are usually indications of indigestion, and most likely they are caused by over-feeding. They are almost always noticed by the nurse, but they are not considered of sufficient importance, even if their true import is understood, to call for any modification of diet. In all such cases, if the customary food were greatly reduced, or withheld altogether for a few hours, the stomach would soon be in a condition to proceed with its labors. This simple injunction, if observed at the right moment, would save a vast amount of illness and even of mortality among infants.

Muscular and nervous fatigue are too often the cause of indigestion. The infant is exposed to many causes of over-fatigue. The number of evolutions the average baby is put through in the course of each day is something remarkable. The rude handling it undergoes during every waking hour by tossing, jolting, violent rocking and shaking; the constant attempt to teach it to stand and walk; the bowling along rough walks in a carriage by boisterous children, are all sources of muscular fatigue which would be trying to an adult. The nervous system is also kept in a state of tension. The intelligence of the child is continually appealed to. The activity of the brain after the first few weeks of life, must be very great. The little creature finds itself in the midst of wonder-land, and the number of mysteries it will unravel in a very few months borders on the marvelous. Its fond relatives are pleased with its brightness, and unduly excite it to the performance of new tricks. Bright glares of light, sharp sounds, little starts of fright from strange attitudes and sudden approaches, the constant rattle of vehicles on the street, the clatter of neighboring machinery, the rude awaking from sound sleep—all these are violent shocks to the sensorium. A single occurrence of the kind is

bad enough, but a frequent repetition must needs enervate the strongest infant. Babies should be protected from violent transitions. They need rest and quiet at regular intervals, and an abundance of it. It will sometimes be found impossible to adapt any form of food to the digestive powers of an infant until it has been moved from its noisy locality to a more quiet street, or to the still more quiet country.

Bathing, when too often repeated, or when the body is kept too long exposed, or when the water used is too cold, will weaken digestion in feeble infants. They generate heat slowly, and the temperature of the body is so much reduced as to interfere with all its functions, digestion included. Besides, they lose heat more rapidly by radiation than strong, fat babies. Fat is a slow conductor of heat, and when all the interstices of the body, and the areolar tissue beneath the skin, are well stored with fat, the loss of heat is comparatively slow.

The want of sufficient clothing also tends to the same results, even in robust children. A decided chill puts an immediate stop to all digestion. We see practical demonstrations of this every day during the summer months, when there is less care taken in protecting the child from strong drafts of air, from exposure in the early evening, or from nakedness in the night. He gets a chill; a little shudder goes through his frame; in a short time he vomits his last meal as he swallowed it, untouched by the gastric juice; a sharp diarrhœa follows soon afterwards, or an attack of genuine *cholera infantum*. The infant's loss of heat from radiation is much more rapid than in an adult twenty times heavier, not only from its smaller bulk, but from its greater relative surface. The skin surface of an infant weighing eight pounds is twice as great to each pound of its weight as that of an adult weighing one hundred and sixty pounds. It can readily be seen how much greater are its chances of a chill from temporary exposure. It will often be found that a feeble infant insufficiently clad will materially improve in its digestive powers as soon as it is kept sufficiently warm.

Protracted heat, though less depressing to the nervous system than continuous cold, is the cause of much injury to the digestive apparatus. Heat is more detrimental because less easily avoided than cold. The latter can be overcome by artificial means always at hand, while the former is often a condition of climate which cannot always be shunned. It is not necessary, in this connection, to go into an elaborate description of the manner in which protracted heat debilitates the



nervous system, and, consequently, the digestive functions. The fact recognized, its practical bearing upon feeding becomes of importance.

During the hot summer months, the very first indications of derangement of the baby's digestion should receive immediate attention. Any unusual vomiting, or excessively acid eructations, or flatulence and colic, or obstinate constipation, or the slightest tendency to looseness of the bowels, all demand appropriate modifications of diet. Before these more conspicuous symptoms appear, however, there is usually more or less of griping pain in the intestines, as evinced by the fretful, worrying state of the child. This condition may exist several days, or only a few hours, before any decided outbreak of graver symptoms. This is the period when a brief suspension of all nourishment demanding any considerable digestive power will prevent the serious disturbances enumerated. At this time, also, extra care in keeping the belly and feet warm should be observed. It is a time, moreover, when any sudden changes in temperature, as from heat to cold or cold to heat, are greatly to be dreaded. How often, during a protracted term of heat, when the child has become in a manner acclimated, and through infinite pains his diet has been suited to his powers of digestion, a sudden change to a cooler temperature has proved the last shock to suspend digestion altogether! At this season there is great risk in making any experiments in diet. Not even the small liberty of variation commonly allowable in an infant's diet should be ventured. The kind of food found by experiment to have most uniformly agreed with it must be strictly adhered to. During very warm days a little weak brandy and water—say ten drops of brandy—may be given every hour to prevent languor and an irritable condition of the nervous system. This simple practice will many times avert the evils so much dreaded.

There is a popular notion that teething has much to do in deranging the digestion of infants. There is no doubt that the pain of dentition may irritate the nervous system, and prove, with other exciting causes, a true source of disorder. But it is noticeable that in winter no such effect accompanies dentition. It will be remembered that, while speaking of the distinctive characteristics of the infant's digestive organs, it was stated that the follicles which secrete the intestinal digestive juices are not developed until the period of dentition. Here lies the real source of trouble. The intestines are then in a transition state from the infantile to the adult condition. They are more than usually sensitive to disturbances from slight causes, and they are sub-

jected to new aliments from the fact that the infant is generally allowed to test pretty freely his new organs of mastication. Very little disturbance of digestion need arise from this cause if the child be treated as an infant until the first dentition is pretty well advanced.

Hereditary tendencies to dyspepsia are also great obstacles to artificial feeding. These do not always have any connection with the more marked constitutional ailments, such as scrofula and tuberculosis. An infant may be born in a debilitated condition. From the very first it is unable to digest any suitable food. Such children are more likely to die than to live. Sometimes, however, they appear to have inherited, with their weak stomachs, a great tenacity of life, and they live along till the proper period of infancy is passed, when there is usually some hope from the development of the intestinal follicles. But they are always dyspeptics, whether they are one year or a hundred years old, as their parents, and perhaps their grand-parents, were before them.

But little has thus far been said concerning farinaceous articles of diet. At the age of twelve months, and frequently at a much earlier age, an infant can digest starchy foods very well. To begin with, they should be partly digested by cooking, i. e., they should be given in a liquid form. A mixed diet is, from one cause or other, frequently preferable to clear milk. It may be preferable on account of the difficulty which many infants experience in digesting milk alone, or it may be desirable in the relief of the obstinate constipation which is so common in babies brought up by hand. The *modus operandi* of amylaceous substances in connection with the digestion of milk has already been sufficiently dwelt upon. They should at first be given in a liquid form, as a kind of preparation for the more solid farinaceous articles which are soon to form a considerable part of a more substantial diet, such as potatoes, rice, bread and oatmeal porridge. Oatmeal and wheat flour are the two most valuable and most accessible of the starchy foods to begin with. They should be thoroughly cooked in a liquid state before being mixed with the milk. When oatmeal is used, the thin gruel should be thoroughly strained through muslin to remove any hulls or undissolved grains. The quantity used in proportion to the milk may be varied to suit the demands of the case.

We now and then find an infant that cannot digest milk in the least quantity, or in any combination whatever. What is to be done? Our resources are by no means so limited as might at first appear. These children always seem to me to have a kind of compensatory peculiarity of digestion—a greater capacity for the digestion of starchy foods.

In the first place, there is the entire list of patented prepared foods, each of which claims special advantages. I have never refused to try a single one of them which has ever been brought to my notice. My success with them has not been such as to induce me to resort to them before first trying the farinaceous preparations extemporized at home. They are convenient, expensive and theoretically "scientific"—three qualifications well calculated to recommend them to popular favor ; but they fail, for some reason, to satisfy the demands of the infant economy beyond a few days. When they have been pronounced successful, they have been used in combination with milk, which, of course, is another phase of the question.

In oatmeal we have one of the most valuable forms of diet for infants. I should place it first on the list of farinaceous foods. It undoubtedly has some advantages over all others. The starch globules are smaller and more readily hydrated on boiling, it contains more fat or oil than any other of the cereals, except maize, and the gluten is abundant and more readily digested than that of any other grain except wheat. It is also rich in soluble salts, while the husk and envelope contain but little of those elements which irritate the alimentary canal and tend to diarrhœa. In short, it approaches more nearly the standard of a typical food than any other of the cerealia. If it fails to agree with the stomach, the cause is oftener found in its method of preparation and administration, or in the quality of the meal, than in the digestive powers of the infant. Here, as in every other article of infant diet, it is necessary to exercise every caution in selection ; for oatmeal is liable to deterioration from fermentation and from the presence of acari, various forms of beetles and worms. These creatures leave excrements in the form of minute granular particles, which furnish a nidus for certain fungus growths, giving the flour a peculiar musty odor.

Success in the use of oatmeal depends upon three conditions, namely, the good quality of the meal, its proper preparation and the quantity administered. As regards quality, a sufficient intelligence on the part of the purchaser should be a protection against imposition. It is easier to procure superior grades now than formerly, since oatmeal has become a regular article of household diet in most American families. The occasional prejudice in favor of imported brands is a mistaken one, for the reason that they cannot come to us so fresh, and they are sometimes adulterated with rye and barley flour. These spurious additions, and especially the former, are grave defects, attended

with danger. It is well known that they possess properties very liable to produce diarrhoea. For infant food it is not necessary nor desirable that oatmeal should be bolted. The more of the cortex or envelope there is left in the meal the better, provided the husks are tolerably removed. In straining all the coarse elements are removed, and it is desirable, in the process of cooking, to extract the nutritive principles from the grain as they are provided by nature.

In preparing oatmeal for food it should be boiled for a long time—not less than two to three hours. When it is to be the regular diet of the child, a special cooking apparatus should be used, for the sake of convenience. All the tin shops keep what is known as the “oatmeal kettle.” It is a kettle within a kettle arranged like the common glue-pot. The outer vessel is partly filled with water, so that the inner one is not brought in direct contact with the fire. The apparatus can be left on the range without any watching, thus avoiding the risk of scorching the food. In cooking the mass should be kept in quite a liquid state, the more readily to extract and dissolve the nutritive elements, and to facilitate straining. It should be strained through coarse muslin, and, if necessary, afterwards diluted with water to the specific gravity of milk (1031.) A little cream and milk sugar may sometimes be added with advantage. Oatmeal gruel, as thus prepared, will seem, to most persons, extremely unsubstantial, and the constant temptation will be to make it “thicker.” The most emphatic injunctions of the physician as to this point will many times be disregarded; the attendants will persist in giving the gruel too heavy, and all his pains will be thrown away. The baby cannot digest so much starch and gluten; acid fermentation takes place, and vomiting and diarrhoea follow.

The quantity to be fed at any one time must be determined by experience in each individual case. It should be small to begin with, and the way felt along gradually, as in all other forms of diet. Gruel made in the way just described does not differ much from milk in nutritive value, bulk for bulk. In the hot weather, it is well to give a little brandy and water, in the same way and for the same reasons as already mentioned.

For some reason, there is an absurd disposition on the part of attendants to be continually tampering with the baby's food. He may be thriving famously on any given food—the oatmeal gruel for instance—and some one suggests that it is too “sloppy,” it ought to be given heavier, or milk should be added, and forthwith the change is

made. Exit baby. If the food is fulfilling the demands of the case, not the slightest deviation should be made—above all is this important during the hot summer months.

Another very valuable farinaceous diet may be prepared by subjecting wheat flour to a temperature sufficiently high to change the starch into dextrine. This is usually done by tying a pound of flour tightly in a cotton cloth and keeping it in a kettle of boiling water for six to eight hours. When the cloth is removed the flour is found in the form of a hard ball, enveloped in a tough skin of gluten. The skin is removed from one side leaving the remainder for the protection of the ball. A portion is grated off whenever required and made into a thin gruel. In changing the starch into dextrine, by the process of boiling, the first stage of digestion is already accomplished before it is taken into the stomach. It also possesses the additional advantage of requiring but little cooking when needed for use, and it can be made into a gruel in a few minutes. Generally the temperature of boiling water is not sufficiently high to change so large a mass of flour into dextrine, the centre of the ball remaining unchanged. The process may be completed by subjecting it to a moderate heat in an oven for an hour longer, using all precaution against burning. The sense of taste is the best test in determining whether the process is rightly accomplished. The mass has a sweetish taste easily recognized when once learned. It should have no raw, starchy flavor. This diet is very palatable and easily digested, rather more so with some children than the oatmeal gruel. It is not, however, so typical a food. Finely bolted wheat flour is almost wholly deficient in fat and in mineral constituents, both of which are needed in the diet. It is advisable, therefore, to add the cream from a quantity of milk equal to that of the gruel used, and also one of the alkaline carbonates and the phosphates, in about the same proportion in which they exist in milk. The gruel should not be sweetened much. This is an excellent form of farinaceous food to use in combination with milk, when the infant can digest milk.

In those cases where dentition is delayed several months beyond the average time of appearance of the teeth, from a scrofulous condition, or from rickets, it may be well to consider the child as in a measure passed the period of infancy, and modify his diet accordingly. He now needs rather more of a variety, and many things can be given in a semi-solid form, which need but little division by mastication. Such, for instance, are finely mashed potatoes, moistened with milk, or

sweet butter, or juice from a roast of beef. Soft-boiled eggs are very suitable, and such children are more than usually fond of them. The egg is another typical food. The yelk is rich in oil and the phosphates, and well-adapted to scrofulous children. Beef juice and animal broths may be given in small quantities. Home-made stale bread, plain "cookies," oatmeal mush with cream, are all relished and digested fairly. Sometimes raw beef, scraped into a fine pulp, and seasoned lightly with salt, may be fed a teaspoonful at a time, with great advantage. The digestion of the more solid farinaceous foods may be greatly aided by giving a little malt (diastase) with the meals.

Who is to decide whether the food is agreeing with the infant—the physician or its attendant? Both; but first the physician, and more particularly in those cases where the attendant is inexperienced. The nursery is a veritable *kindergarten*, in which many "object-lessons" are to be learned. In most American families the mother is the nurse, and, in many instances, the sole attendant of her infant. This is as it should be. The maternal feelings quicken the intelligence and make the mother an acute observer, and a ready listener to all that concerns the welfare of her offspring. A little physiological lecture will give her all the principal points connected with the digestion of milk. She must be taught what to observe, and given some general idea of the significance of her observations. She will thus know in season what requires the attention of the physician. She should know what constitutes a natural stool, for instance, and what a healthy mouth and a sound skin are.

Though not strictly within the province of this essay, it may not be inopportune to say a word in conclusion about wet nurses. The trouble and danger of artificial feeding are so generally understood they are greatly dreaded by all concerned. Those able to employ a wet nurse are often inconsolable in their repeated failures in procuring one. I have shared their disappointments in fruitless efforts in their behalf. A good wet nurse is so rare a creature I have quite given up the search for her. The chances are that a goat will serve a better purpose, and she can be obtained with one half the trouble, and be free from all risk of disease. Wet nursing as a rule must necessarily be a failure. The relation between nurse and child is, in a very important sense, an unnatural one. Except in rare instances the feelings of maternity are wanting. The nurses belong to a class of "unfortunates." They come from the poorer classes, and from all nationalities. They are the victims of distressing circumstances.

They have either lost their own baby, or deserted it in the stress of poverty for the hire of nurse. They are the creatures of grief in either case, and they come to their new charge with a "far away and long ago" look painful to behold. In many instances they are obtained several days after the loss of their own child, when lactation has already become lessened from the effects of grief and other causes. Their painful recollections and new surroundings produce a mental state unfavorable to the free and healthful secretion of milk, and the chances are they will give out altogether in the course of a few weeks.

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THE  
VENTILATION OF SCHOOL HOUSES,

BY  
WILLIAM A. MOWRY, A. M.,

PROVIDENCE, R. I.,

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## THE VENTILATION OF SCHOOL HOUSES.

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*Dr. C. H. Fisher, Secretary State Board of Health :*

DEAR SIR:—You have asked me to give you a paper embodying the results of my experience and observation upon the Ventilation of School Houses.

I cannot enter into any exhaustive treatise upon this important subject, nor would it be desirable, if I had all the time and facilities at hand to do so. But, I apprehend, what is most needed in this utilitarian age, is the result of experience—practical facts.

Let me then, as briefly as I may, give you some conclusions at which I have arrived, and which I believe will be found to be correct and scientific. For more than twenty-five years, during which I have been constantly engaged in teaching, I have been compelled to give more or less attention to the subject, and during some of those years, it has been one of the leading topics of my special study.

I need not say that I have found as wide a diversity of belief and of practice, concerning principles and facts, as upon almost any other subject that can be named.

It is not to be wondered at that the most crude and erroneous ideas remain in the public mind, when the highest authorities differ so widely in relation even to the most fundamental principles.

1. In what do the noxious elements of foul air consist?
2. Do the poisonous gases—carbonic acid, for instance—rise to the top, or fall to the bottom of the room?
3. Hence, should the foul air be drawn off from the top or the bottom?
4. Should the bad air be *drawn* or *forced* out of the room?
5. Is steam heat better than furnace heat?
6. Is direct, or indirect radiation from steam pipes to be preferred?

These are only examples of questions upon which the most diverse answers are given, and that by intelligent people, and even those

who have made the study a specialty. We have only to visit our school houses, in any part of the country, our court houses, our churches, or public halls, to be convinced that correct principles of ventilation are successfully applied but very rarely.

#### CARBONIC ACID.

It was formerly considered by many that carbonic acid, being heavier than the atmosphere would sink to the floor, and must be taken off from there rather than from the top of the room. Many exhaustive experiments, however, have shown, that in accordance with the universal law of the general diffusion of gases, this poisonous element soon becomes universally diffused throughout the air, especially when the air is kept in constant agitation by moving about the room, as, for example, when large classes leave their seats to take places for recitation, and return.

Indeed, if you place the open mouths of two jars together, the one upright and the other inverted, with the lower one filled with carbonic acid gas, and the upper one with hydrogen, the lightest gas known, in a short time they will be found to have become almost perfectly and equally intermingled throughout the whole mass.

But this carbonic acid, breathed out from the lungs, is not the only unhealthy element found in the air of a school-room. There are constantly floating in such air considerable quantities of animal matter, effete effluvia, thrown off from the skin, exhaled from the lungs, or otherwise interjected into the air, which, perhaps, may prove quite as deleterious as the carbonic acid.

#### OBJECT OF VENTILATION.

The object of ventilation is two fold, and not as so often regarded, simply for *one* purpose.

1. It must introduce into the room a constant and sufficient supply of pure air from without.

2. It must carry off from the room the air already rendered impure and which holds the deleterious elements. The well known "Sexton's plea for pure air," shows with more graphic vividness, perhaps, than elegance, the necessity for a constant supply of pure air to be furnished, where many pairs of lungs are constantly vitiating the air to be breathed. We have right here, therefore, one of the fundamental principles, always to be remembered, that *a supply of pure air*

must constantly be kept up. It is useless to make ventilating shafts, to carry away the impure air, so long as there is no supply of fresh air furnished.

This principle of a *constant and abundant supply* of fresh air cannot be too strongly insisted upon.

No one method of heating or of ventilating will answer in all cases, since the conditions vary so widely. For example, in a country school house of but one room, usually heated by a stove, a very different set of circumstances exist from the case of a city school of eight, ten or twelve rooms under one roof, and perhaps upon four different floors. What would be easy and rational in one case has no application in the other.

#### A COUNTRY SCHOOL HOUSE.

In the one-room building, heated by a stove, one of the best methods of obtaining an even temperature and wholesome air, is by having (1) a double cylinder stove, with hot air chamber or passage between the *real* stove and the outside covering, and (2) to furnish a supply of pure air and take off the bad air, by a Robinson's ventilator.

From 1865 to 1870 I used the stove here suggested, in a room about thirty by forty feet in size, with from forty-five to fifty pupils. The room was heated throughout the cold season with less than two tons of coal, (one season using but a ton and a half.) Some of the pupils sat within five feet of the stove without feeling excessive heat, and others were sufficiently warm on the opposite side of the room. The temperature of the two sides of the room—on one side within five feet of the stove, and on the other side nearly fifty feet away—would show a variation by the thermometer of not more than two degrees. By this method the cold air is drawn along the floor slowly from all points, and the heated air thrown out at the top of the stove passing to all parts of the room.

The Robinson's ventilator placed in the upper part of the room and passing out through the roof will constantly pour in a supply of pure air on the one side, and take away the foul air upon the other, and this too without producing an objectionable current upon the heads of the pupils.

#### A CITY SCHOOL HOUSE.

In large houses, consisting of several rooms and on different floors, other means must be provided. Let us consider several of the principles involved.

## I.—SURFACE AND CUBICAL CONTENTS.

It is of great importance to have sufficient space for a proper quantity of air.

A room designed to seat forty to forty-five pupils—at the most fifty—should be 30x40 feet, thereby having a floor of 1200 square feet.

The height of the room should be not less than twelve nor (ordinarily) more than fifteen feet. A good rule is to allow, *in all cases*, twenty-five square feet of flooring and three hundred cubic feet of air to each pupil.

## II.—HEATING.

The public have been entertained of late years—if not enlightened—with much discussion of the relative merits of furnace heat and steam heat. We have had all the changes rung upon the superiority of the latter over the former. “It is a soft heat;” “a moist heat;” “has a more healthy, life-giving, invigorating tone,” &c., &c. I would not say that the modern method of steam heating has no advantages. It is not affirmed that this method of heating is in no case a success. There are many instances in which intelligent people are entirely satisfied with it and would have, if possible, no other method. Yet I am fully persuaded, that, as a general rule, for school houses, it does not prove so satisfactory as furnace heating, and that the present tendency of the public mind in swinging back from the steam heating to furnaces is in the right direction. My own observation and experience lead me to believe that good furnaces, properly arranged and carefully kept, will afford better results in relation to ventilation, quality of air, quantity of heat and cost of heating, than the most approved methods of steam heating.

The popular idea that steam heat imparts a softer, moister, purer tone to the air, possibly may rest somewhat upon the imagination.

When water is boiled in an open vessel it gives off steam, and this, of course, conveys moisture into the air. “Heating by steam,” therefore, very naturally suggests the boiling tea-kettle. But close the boiler, air tight, and convey the steam around the room and out of it, in air tight, steam tight pipes, and how, pray, can these pipes, heated by steam, give a *moist* tone to the air?

The only way it can be done is by opening a stop-cock and letting out the steam. But, if moisture is needed it can be obtained, in a much more desirable way from a furnace than by opening an escape valve in the steam pipe and letting out a quantity of dirty, filthy

steam, formed from dirty water, impregnated with iron rust and oil.

Place an evaporating pan in connection with the furnace, supply it with pure, clean water, and in a large furnace, suitable for school purposes from two to four pails of water a day may be evaporated, in cold weather, especially if the air be unusually dry, so as to render this evaporation desirable.

It is often said that whenever the furnace becomes red hot, and the air to be heated comes in contact with this red hot iron, "the air is burned up;" it is "dried out;" it "becomes dead;" it "loses its vitality," etc., etc.

The air is a mixture of oxygen and nitrogen. Which is "burned up?" Surely, not the oxygen, for that is not (in the ordinary sense of the word) combustible. It cannot be the nitrogen, for that unites with no substance, except with extreme difficulty and by indirect means. If the air is rendered "dry," where does the water go to? If moisture is in the air, it must either remain there, or be absorbed by some surrounding objects. But it is proverbial that all furniture is baked and becomes dry by furnace heat, and *equally so by steam heat*.

The truth is that whether the house be heated by steam or by furnace, the temperature is often raised to a much higher point than is necessary, and the higher the temperature the greater the capacity of the air to absorb moisture. The dry air, so called, therefore, is the consequence of *too much* heat, and has but little reference to the kind of heat.

It is not to be denied, however, that a change may be produced in the quality of the air for breathing, by *over heating* it. The healthfulness of the air,—in other words, its adaptation to its proper use in breathing, depends upon certain minor conditions, extremely difficult to explain.

Why is the dry air of Minnesota better for consumptives than the atmosphere of New England? Why are certain classes of invalids benefited by a protracted visit to Florida? Why are some asthmatic patients freer from their difficulty of breathing near the seashore, while others are better inland, and can scarcely live at the coast?

It is very probable that by superheating the air, its ozonic and electric conditions are so changed as to interfere somewhat with its best adaptation to the needs of the lungs. But it is confidently claimed that with furnaces of sufficient size, properly taken care of, and regulated, so as to avoid this extreme temperature, the difficulty may ordinarily, in nearly all temperatures to which we are liable in this

climate, be avoided, or so reduced to a minimum, as not to be of serious consequence, and probably so as to prove quite as little injurious as steam heat, especially when other circumstances are taken into the account.

On the other hand, it is without question that furnace heat is more reliable, both in extremely cold weather, and in mild weather, in relation to quantity. On very cold mornings, it is often with the utmost difficulty that large rooms can be heated to a proper temperature by 9 o'clock, with the ordinary steam heating apparatus. On the other hand, it is within my own personal knowledge, that there is no difficulty in securing an atmosphere in such rooms, of 68° or 70° Fahrenheit, at that hour by properly regulated furnaces.

Again, on warm days, when less heat is needed, it is far easier and simpler to secure the small quantity of heat required, by hot air furnaces, than by the steam method. Steam cannot be formed without heating the water to the boiling point, 212°, which gives more heat than is needed, but with a furnace the fire may be left to smoulder and it will last often for days, without any replenishing, giving off what little heat is required, and so furnishing a steady, uniform, proper temperature.

It is important in heating by furnaces, to have *good* furnaces, properly constructed, and properly managed. Many furnaces fail of producing satisfactory results because *the cold air boxes are too small*. There must be a full supply of pure air if good results are expected.

Then in regard to economy. In a New England city stands a school house, built a few years ago, containing about 150,000 cubic feet to be heated. It has the most approved system of steam heating by *indirect* radiation. I have been informed that two hundred tons of coal are used each year to heat this building.

In another city stands a school house, built about the same time, containing about 300,000 cubic feet. It is heated by five large furnaces, which have consumed only eighty-five tons of coal, each year for the last five years, and there has never been a morning but once, when the air has not been sufficiently warm in all the rooms at 9 o'clock, and that was on account of the draft having been left open, so that from the wind rising suddenly and blowing severely in the night, the fires went out, and the building was found in the morning with no fires in the furnaces. Yet by new fires the rooms were quite comfortably warm by 9 o'clock, and had sufficient heat by 10 o'clock.

## III.—SUPPLY OF PURE AIR.

By means of these furnaces, the air is ordinarily taken from out doors, and a constant supply is poured into the rooms.

If, however the steam heaters are used, the method of indirect radiation only should be employed, which furnishes the same supply of fresh air. In *no case* should direct radiation be used unless there is by some means a constant supply of fresh air kept up. The impure air cannot be forced out, unless there is a supply to take its place.

## IV.—PLACE OF PIPES FOR PURE AIR.

It is better that the hot air pipes should lead up into the rooms to be heated, next the outer walls of the house, inasmuch as by this means the heated air poured into the room will be carried by natural currents to the opposite side, and in this way an equality of temperature will be produced, through all parts of the room.

## V.—PLACE OF PIPES FOR IMPURE AIR.

The ventiducts should then be placed on the opposite side of the room from the hot air pipes and neither should be near the teacher's platform. This plan will then ensure a general circulation of air throughout the room, and an equality of temperature.

## VI.—CHARACTER AND ARRANGEMENT OF VENTIDUCTS.

1. These pipes to carry away the foul air, should be placed in the wall of the room, and should *in all cases be perpendicular*, never horizontal in any part, but, proceeding vertically from the side of the room, pass out through the roof ending in some approved ventilating cap.

2. These pipes should each communicate with only one room. In no case should two or more rooms, whether on the same or different floors, communicate with the same ventiduct.

3. These ducts should be round, and as *smooth* as may be upon the inside. A round pipe, whether to admit pure air, or to carry away the impure air, will carry a vastly greater quantity than a square one of the same surface capacity.

Besides, a pipe with a smooth surface,—and the best that I have seen have been lined with tin— will conduct rapidly a column of air through it, but a pipe with a rough interior is generally of no value whatever, since it is utterly impossible to force a current of air through it.



## VII.—SIZE OF THE VENTIDUCTS.

Upon no point is there a greater diversity of opinion and of practice than in reference to the size of the pipes or ducts necessary to carry off the foul air. It was formerly thought that a small brick flue eight inches square placed in the wall of a building with a register of equal size opening into the room, was sufficient to ventilate perfectly a large school-room.

A fine building was erected ten or fifteen years ago for one of the most noted schools of New England, in the walls of which (the house being built of brick) were placed two such flues as described above to each large room. These flues not targeted and left smooth within, but with rough and jagged sides, it was supposed would be ample to carry off the foul air produced by fifty or a hundred pupils.

On the other hand, in some cities may now be found huge ventilating shafts from three to five feet square, with openings into the rooms eighteen inches wide and three or three and a half feet long. Such a shaft running up between two rooms would communicate with both, on each of three or four stories, thus acting as the duct for foul air from six or eight large school rooms. Of course, it requires no argument to show that great quantities of heated air would be carried off in cold weather, when less ventilation was needed, and in mild weather the operation would be greatly diminished.

The old adage, "Large bodies move slowly," is as applicable to *air* as to solids. Is it not easy to see therefore that there must be certain dimensions for an air duct, as well as for a smoke flue, which will carry off a greater quantity of air or smoke, than a larger or a smaller pipe?

The fact is, in cold weather, when there is a great difference between the temperature within and without, the pressure of the atmosphere will give sufficient power to drive a great quantity of air through a large shaft, while in mild weather, it will require considerable *power* to create and keep in motion a draft through such a pipe. Then if several rooms, especially if they are upon different floors, open into one shaft, it will often happen that there will be a draft *out of* one room, and *into* another.

Frequently, another difficulty is experienced by having several rooms open into one duct, by reason of the communication of sound from one room to another, so that the exercises in one will be heard in another.

I have found that a round tin-lined pipe of twelve or fifteen inches

in diameter has proved quite as satisfactory as any, to carry off the foul air from a room 40x30 with from forty to fifty pupils.

#### VIII—POWER TO BE USED IN VENTILATION.

Every one knows that any one of various plans will show good results in *cold weather*, but will be of less service in warm, cloudy, or stormy weather.

There is no system that has ever fallen under my observation which works well in all weathers, and at all temperatures without the aid of *power* to carry off the foul air.

In cold weather, with large quantities of fresh air poured into the rooms from the furnace or steam heater, the air will be forced out at almost any kind of a duct. But in mild, heavy weather, sometimes called "*muggy*," some *power* is absolutely necessary to produce a current from the room. Various methods have been devised and put into operation to effect this object; for example, whirligigs upon the top of the ventiducts, an iron smoke stack in the center of the shaft, a coil of steam pipe at the bottom of the duct, or a small gas stove within.

Some method of this kind is absolutely necessary to good success in ventilating at all temperatures. I have found the most excellent results from a small gas stove or heater, placed in the bottom of the duct. It requires only the quantity of gas consumed by a single, ordinary, burner, for lighting purposes. The gas, after being thoroughly mingled with the atmospheric air, is passed through wire gauze, and burned above this netting.

#### OPENINGS—TOP OR BOTTOM ?

Diverse opinions have prevailed also, in relation to the place for withdrawing the foul air. Shall the openings in the ventiducts be near the top or bottom of the room?

Bearing in mind that the poisonous gases are thoroughly diffused throughout the room, and that the tendency of heated air is to rise, and that the ducts are vertical for the *purpose* of carrying off these impurities, it would seem that no one *ought* to question the position that the greater part of the foul air to be taken off, would be best carried away from the upper part of the room.

The most satisfactory results will without doubt follow, where large registers are arranged both at the top and the bottom of the room. After the rooms are properly aired in the afternoon, the upper registers may be closed till next morning at 9 o'clock, and then opened.

It has been my practice to let the lower registers stand open at all times, and the upper ones, during school hours.

Let me add a word or two of caution. Do not think that a plan which appears to give good results in one case is the only proper plan in the world, or that it will do equally well in other places. Do not elaborate any pet theory, and settle down into the belief that this plan is perfect and all others are fallacious and useless.

Do not depend upon any one plan alone. Whatever general method you adopt, supplement it by all other means in your power. The air is a very treacherous element, the most difficult of all to harness and control. It is necessary, therefore, to use all possible aids and appliances to accomplish the purpose.

One of the best illustrations of what is here meant, may be stated as follows:

After arranging for the reception, through pipes and registers, in the school-rooms, of an abundant supply of fresh heated air, and for the carrying off of the impure, vitiated air by ventiducts, then heat the corridors, passage-ways and entries, and leave all doors open into these corridors from the school-rooms, and thereby permit a general circulation of air from the several rooms to the corridors. In addition, it will facilitate very much, if hot air be poured into these corridors at the foot of the lower stair-cases, and a large ventilating pipe pass out through the roof, from the upper hall of these corridors and passage-ways. By these means, a draft throughout the building is promoted, and that without the deleterious effects always produced by opening windows and allowing a draught of air to blow directly upon the heads of the pupils.

The above comprehends, in substance, such observations as have grown out of my own study and experience. I am well aware that the discussion is by no means exhaustive, but as stated at the outset, such discussion would be neither possible or desirable.

With the hope that those who have the matter in charge, in our various towns and cities, will unite in doing all possible to spread, so far as ascertained, the knowledge of the true principles of ventilation, so that at no distant day, bad or defective ventilation of school houses will rarely, if ever, be found in our State,

I am, dear sir, very respectfully yours,

WILLIAM A. MOWRY,

*English and Classical School, 49 Snow Street.*

PROVIDENCE, January 1, 1880.

# SEWERAGE OF THE DWELLING,

BY

ORVILLE. FISHER,

CIVIL AND SANITARY ENGINEER,

PROVIDENCE, R. I.,

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## SEWERAGE OF THE DWELLING.

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The sewerage of the dwelling is such an important branch of the system of general sewerage of a city, or town, that upon the skill and care exercised in carrying it out, depends much of the safety and utility of the general system.

It is not enough that we provide means for the removal of the liquid refuse from the dwelling, but it is quite as essential that we protect the dwelling against the entrance of sewer air, which may through faulty connecting sewers, enter the dwelling and exert its malarious influence upon the occupants.

A system of house-sewers that does not completely and rapidly remove all liquid refuse and fæcal matters, and at the same time prevent the escape of sewer air into the dwelling, must be considered unsafe and imperfect.

Every owner and occupant of a dwelling should so far investigate and make himself familiar with the subject of house-sewerage, as to understand and appreciate some of the dangers that accompany a neglect to have the sanitary arrangements of the dwelling planned and executed in a thorough and workmanlike manner, also that these arrangements require constant care and frequent examination, to ensure that they remain in condition to fully and safely do the work required of them.

Unfortunately, the majority of persons do not take sufficient interest in the sanitary arrangements of their dwellings, either to examine into their condition themselves, or to employ a competent person to do so for them. In general, nothing is done in the way of an examination of the sanitary arrangements of the dwelling, so long as there is no disagreeable or positive odor emitted from them; or until sickness and death occur among the occupants, of a nature that leaves little doubt that the origin and cause of such sickness and death, is to be

found in the poisonous gases that have found entrance through the defects in the house-sewers and their connections.

As the public sewers are intended to collect, concentrate and carry away the liquid refuse and fecal matters of the city or town, and as these matters often are the source of contagious diseases, we cannot be too careful in making proper connections between them and our dwellings. The necessity of such care will be better appreciated, when it is remembered that the public sewers are often poorly ventilated, and sometimes not at all, and that accumulated gases become so foul in them, that the workmen are often obliged to wait until the gases escape upon removing the man-hole covers, before they can enter. Especially is this the case in winter, when the man-hole covers, which are usually perforated with holes to provide ventilation for the sewers, become frozen down and closed with ice and snow, and when the increased warmth of the dwelling has an extra tendency to draw the sewer-air, through its connecting sewer into the dwelling.

The following "Requirements for the Drainage of every House," which appeared in "The Plumber and Sanitary Engineer," September 1st, 1879, covers the subject so well and completely, that I think it best to repeat them here.

They are requirements which cannot be too well known, nor too fully complied with by every house owner.

"Every house-drain should have an inlet for fresh air entering at a point inside the main trap, and carried to a convenient location *out-of-doors*, not too near windows.

"A trap should be placed upon every main drain to disconnect the house from the sewer or cesspool. In places liable to unusual pressure from the sewer, it should be a double trap, with vent from between the two traps, running up full size above the roof; or, where the pressure from the sewer is only occasional, and the rigor of the climate will permit, this vent may be carried to the sidewalk or area, at a safe distance from the windows. If the first trap is forced the gas can gain easier exit through this pipe than through the second trap.

"Every vertical soil or waste pipe should be extended at least full size through the roof.

"No traps should be placed at the foot of vertical soil pipes to impede circulation.

"Traps should be placed under all sinks, basins, baths, wash-trays, water-closets, etc., and as near to these fixtures as practicable.

“All traps under fixtures, wherever practicable, should be separately ventilated in order to guard against syphonage. Such vent pipes should not branch into a soil pipe below where any drainage enters it. In some cases it is preferable to carry it to outer air independently.

“Rain-water leaders should not be used as soil pipes, and when connected with house-drains they should be made of cast iron in preference to galvanized sheet iron or tin, there being less liability of corrosion. Joints should be gas and water-tight, to preclude possibility of drain air entering open windows.

“No safe waste should connect with any drain, but it should be carried down independently to a point where its discharge would indicate the existence of a leak or any overflow above.

“No waste from a refrigerator should be connected with a drain.

“Unless the water supply is ample, so that it will rise to every part of a building, ensuring at all times the proper flushing of fixtures and traps, a cistern should be provided into which the water will rise at night, or into which it may be pumped. Said cistern should be large enough to hold an ample daily supply, be kept clean, covered, and properly ventilated. The overflow pipe from it should *never* be run into any drain *under any circumstances*. The supply for drinking-water should not be drawn from it, but from a direct supply, *i. e.*, direct from the street main.

“Water-closets should not be supplied directly from street pressure or by a pipe from which branches are taken for drinking water. Where the valve closets are preferred to those that are supplied from a small cistern immediately over them, then the supply should be taken to a storage tank, from which it can be conveyed to the valves on the closets, thereby ensuring an equable pressure and securing more reliability in their working.

“All drain pipes within a house should be of *metal* in preference to stoneware, owing to the liability of the latter to crack and the difficulty of keeping the joints tight. It is best to run them along the cellar wall or ceiling with a good incline. They should *never* be hidden underground, as then leaks will not be perceptible. In some places it is common to paint pipes white so that any leakage will show itself to the most careless observer.

“All drains should be kept at all times free from deposit; and if this cannot be effected without flushing, special flushing arrangements should be provided so as to effectually remove all foul matter from the house drains to the public sewers.



"All drains should be laid in a straight line, with proper falls, and should be carefully jointed and made water-tight. No right-angled junction should be allowed, except in the case of a drain discharging into a vertical shaft.

"No drain should be constructed so as to pass under a dwelling house, except where absolutely necessary; and then it should be constructed of cast iron pipes, with lead caulked joints laid so as to be readily accessible for inspection, and ventilated at each end.

"Whenever dampness of site exists it should be remedied by laying subsoil drains, which should not pass directly to the sewer, but should have a suitable break or disconnection.

"Water supply and drain pipes should be concentrated as much as possible, and not scattered about a building. Horizontal pipes are objectionable.

"Plumbing fixtures should not be hidden behind walls and partitions where their condition is never apparent. They ought properly to be open to view and so situated that any leak would be readily detected. It is also well to have a plan of the plumbing of each house for the tenant's or owner's convenience and guidance in any emergency.

"In planning house drains they should be got outside the walls of the house as quickly as possible, so that there may be few joints of pipe, and the smallest chance of leakage from defects or accidents; taking proper precautions in locating to guard against freezing."

Mr. Edw. S. Philbrick in an article on "Domestic Sanitation," which appeared in an issue of the above mentioned paper for August 15th, 1879, makes the following valuable remarks and suggestions upon the construction and abuse of urinals and water-closets:

"Of all the fixtures set up by plumbers, the most troublesome and the most difficult to keep clean are the urinals. No wooden material should ever be allowed about them within spattering distance. The surfaces exposed should be smooth and absolutely impervious to water. Glass or thoroughly glazed porcelain is of course the best, but slate well smoothed is a very good surface. Lead is soon encrusted with a film of oxide, which contributes to the accumulation of filth, while brick is as bad as wood, if not worse. The floors under and about the urinals are often very offensive, even where the fixture is well flushed and clean. A perfectly satisfactory material is yet to be found for such floors. Even tiles have joints which are slightly absorbent while sheet lead is soon roughened by oxidation and liable to crack and

hoard up the nastiness beneath. Glazed tiles laid in Portland cement are perhaps as good as anything. But whatever the material may be, nothing but frequent and thorough washing will keep such places from becoming an offense. The fewer they are in number inside of a house the better for the inmates, provided always that they are not entirely omitted in some form or other, and are made of such ready access as to meet the actual wants of the family. There should be every possible facility afforded for cleanliness at such places, by supplying water freely, and no end of vigilance must be used to enforce such cleanliness.

“The reckless abuse of water-closets by men and boys when using them as urinals is one of the most disgusting items encountered in the proper management of the household. This is a matter of personal purity, and should be considered and taught by every father to his son. Of course, this evil is much aggravated by the improper wooden casings usually applied. Lead safes surrounding the seats may be better than none, but enamelled iron is very much better.

“It would be better yet to dispense with all wood-work whatever and use nothing but glazed and impervious surfaces, if such could be made consistent with comfort. This may be done in warm climates and certainly should be.”

In laying the house-sewer too much care cannot be taken to secure air and water-tight joints. They should resist alike the escape of the sewerage into the surrounding soil, the entrance of subsoil water, and the minute rootlets of trees and plants, which in search of moisture seek out and force themselves through the smallest apertures in drains and sewers, thus causing the sediment to collect, and finally choke up the sewer.

The course of the communicating sewer should be a straight line if possible, and where one straight line cannot be adopted, there should be straight lines from angle to angle, with inspecting and ventilating shafts at the angles. These shafts should be so arranged, that they can be used for flushing the sewer when required.

The inclination should be regular and continuous, and sufficient to ensure a velocity that will keep the pipes at all times free from deposits.

A velocity of from three (3) to ten (10) feet per second will generally prevent accumulation of sediment in house-sewers, which vary in size from three (3) to nine (9) inches in diameter.

The following table, (taken from J. Bailey Denton's Sanitary En-

gineering, page 67,) gives the velocity and discharge of sewers of different sizes, laid with different inclinations, when running full:

Diameter of pipe.	180 ft. per minute. 3 ft per second.	270 ft. per minute. 4½ ft. per second.	360 ft. per minute. 6 ft. per second.	540 ft. per minute. 9 ft. per second.				
Inches.	Fall.	Gallons per minute.	Fall.	Gallons per minute.	Fall.	Gallons per minute.	Fall.	Gallons per minute.
3	1 in 69	54	1 in 30.4	81.0	1 in 17.2	108	1 in 7.6	162
4	1 in 92	96	1 in 40.8	144.0	1 in 23.0	192	1 in 10.2	288
6	1 in 138	216	1 in 61.2	324.0	1 in 34.5	432	1 in 15.3	648
9	1 in 207	495	1 in 92.0	742.5	1 in 51.7	990	1 in 23.0	1485

Mr. Denton says: "In applying the table practically, reference should of course be had to the maximum rate of outflow which may take place at any time of the day. It will be observed, that the number of gallons which the different pipes are capable of discharging in a minute, when running full at the different inclinations specified, will often exceed the total quantity of sewage to be discharged from a dwelling in the whole of the day, and yet it may be desirable to use a pipe with such excessive capabilities of discharge."

Where the house-sewer passes through the foundation walls, a relieving arch should be placed over the pipe, to prevent any settling of the building from destroying or misplacing it.

In order to ensure true position and stability for the pipe-sewers, they must have uniform support throughout their entire length. To secure this, where they are placed beneath the surface of the ground, the trench must be hollowed out to receive the joints. In treacherous and unstable soil, care must be taken to provide a good foundation to prevent the sinking of any of the pipes, which would destroy the regularity of the fall, and thus impair the utility of the sewer.

The junction of two sewers should be so arranged that the flow of the sewage in both will be as little impeded as possible. The connection should never be made so that the discharge from one sewer shall enter the other at right angles to its flow, but always at an acute angle. The smaller the angle the less will be the retardation of the flow, and the less liability of any deposit forming to choke up the sewer at the junction.

Curved junctions make the best connections. The larger the radius of the curve described by the entrance of the tributary sewer, the less impediment will be offered to the flow of the sewage in the main sewer.

Whenever it is necessary to use curves or angles in the pipes, it is well to give them greater inclination at such points, in order that the increased friction may be overcome. Especially should this be done where the house-sewer enters the public-sewer.

The velocity of the sewage from the tributary sewer, when it enters the main sewer, should at least be equal to the velocity of the sewage flowing in the main sewer.

A sewer should not be tributary to one of equal dimensions with itself, but should always have its discharge into one of larger dimensions: that is, a six-inch into a nine-inch, a nine-inch into a twelve-inch, rather than a six-inch into a six-inch, or a nine-inch into a nine-inch.

The inverts of the tributary sewers should be above, or at least on a level with the ordinary flow of the sewage in the main sewer. If they are below this, the smaller sewers will very likely become choked, owing to the sewage being backed up in them from the main sewer. The velocity of flow being thus stopped, the sediment is allowed to settle and collect.

It has not been the object of the foregoing article, to treat of the sanitary appliances of a modern dwelling in detail, but simply to again call attention to the very urgent necessity of exercising due care in the introduction of these appliances into our dwellings.

If these appliances are properly constructed and taken care of, they are a valuable acquisition to a dwelling. If they are faulty in construction and neglected, they may become very unpleasant if not dangerous.



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PROPER DISPOSITION  
OF THE  
EXCRETÆ OF THE INTESTINES AND KIDNEYS,

BY  
ROBERT F. NOYES, M. D.,

PROVIDENCE, R. I.

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# PROPER DISPOSITION

## OF THE

### EXCRETÆ OF THE INTESTINES AND KIDNEYS.

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In considering the proper disposition of urine and feces I shall waive the question of the *necessity* of their removal. It is not within the scope of this paper to point out the relation between poor hygienic surroundings on the one hand and specific diseases on the other. I consider the importance and necessity of the removal from our estates and immediate surroundings of the excretæ of the intestines and kidneys upon good and sufficient grounds settled, and although much which I shall say may be considered elementary, yet the importance of that which is common place should not be ignored in our zeal to grasp that which is more novel.

The amount of liquid and solid excrement of populous places may be approximately estimated.

Physiology teaches that six ounces of solid matter and two and a quarter pounds of urine are excreted by each adult every twenty-four hours.

By the census of 1875, the population of Providence was fixed at 100,675. Of this number 72,319 were more than 15 years of age. A simple mathematical calculation determines that there are by the adult population of this city 13.55+ tons of feces and 81.35+ tons of urine daily excreted. The exact amount of urine and feces excreted by children of different ages has not been accurately determined. It is well known that the amount of food required by the child and the amount of matter excreted is greater in proportion to the weight than that of the adult. Prof. Wm. B. Carpenter estimates the amount of urine excreted by children as nearly double in proportion to the weight of the body as that cast off by the adult.



By the census of 1875 it appears that the number of children between 10 and 15 years of age was 7997. Estimating that from each individual of this class there are two and a quarter pounds of urine and four ounces feces excreted every twenty-four hours, we have from this source 8.99+ tons of urine and 1999 $\frac{1}{4}$  pounds of feces as the daily amount.

The same census also shows that there were 9429 children between the ages of 5 and 10 years. Upon the basis that each of this class excretes one and a quarter pounds of urine and three ounces of feces daily, the amount is readily calculated at 5.89+ tons of urine and 1767.93+ pounds of feces as the average daily quantity.

In 1875 there were also in the city of Providence 4044 children between 3 and 5 years of age. Considering that by each one of this class there is one pound of urine and two ounces of feces daily excreted, we have 2.02 tons of urine and 505 $\frac{1}{4}$  pounds of feces as the total daily amount. The number of children in the city of Providence less than 3 years of age was 6876. Calculating that from each of this class two-thirds of a pound of urine and one and a half ounces of feces are daily excreted, we have 2.29+ tons of urine and 644 $\frac{3}{8}$  pounds of feces as the amount cast off in twenty-four hours.

A cursory examination of the above estimate shows that by the population of the city of Providence there are daily cast into privies, cesspools and sewers not far from 100.54+ tons of urine and 16 tons of feces.

In addition to this the excretæ of horses is not unimportant and is to be calculated. Estimating the number at 6000, which Dr. Fisher informs me is a fair estimate, and that from each fifteen pounds of feces and 30 pounds of urine are daily excreted, we have 135 tons per diem from this source alone. Thus not far from 91,812.1+ tons of excrement are cast upon the ground or are deposited in privies, cesspools, stables and sewers in this city annually. The above amount although apparently large is not in reality an exaggeration.

In the above estimate the amount excreted by the population of Providence has not been overestimated, and no account has been taken of the excretæ of the 3500 dogs nor of other domestic animals existing in the city. The exact proportion of this amount actually removed from the city through sewers, and carted away from privies and cesspools will vary, depending upon a variety of circumstances.

Much is lost by evaporation and absorption by the earth. The urea, of which one ounce may be considered as the average daily

quantity excreted by the adult, is frequently, by the presence of a catalytic body caused to unite with water, when carbonate ammonia results, much of which because of its volatility is lost.

The question of the removal of these matters from populous places, is of prime importance and has long engaged the attention of sanitarians. They have endeavored to remove these excretæ and still appropriate them to fertilization.

Some maintain that the pneumatic system of sewerage is preferable to all others. Others advocate cremation. Some recommend the use of dry earth, while others claim that sewers or underground channels are the best method.

The fluidity of much of the excretæ precludes the practicability of cremation. The dry-earth system consists of the immediate application to excrement of dry pulverized loam, and the removal of the whole at short intervals to lands requiring fertilization.

In the application of this method it is important that the loam be thoroughly dried and pulverized. It is also essential that the earth closet or apparatus intended for indoor use should be carefully managed. The amount of loam applied to the excretæ should not be small, its application should be immediate and the whole should at short intervals be removed from the dwelling.

This method, when carefully employed, has achieved good results in hospitals, barracks and school houses. The liability of the apparatus, however, to become imperfect by use and the amount and nature of the earth required have rendered this system impracticable in densely populated districts.

In rural districts the application of loam or ashes to excrement is to be recommended as a simple, cheap and efficient method.

By the pneumatic system, iron receptacles of sufficient size are placed under the pavements of all principal street crossings. Running into the iron reservoir are a number of small pipes communicating with the privies in the immediate vicinity, without the intervention of cesspools. Each pipe is provided with a valve which may be worked from the street. The privy contents are first forced into the receptacles, then removed and carried away in the following manner: A steam engine appears at a given street-crossing and exhausts the air from the reservoir and iron pipes as far as the valve already mentioned. These are now opened and suddenly, by atmospheric pressure, the contents of the privies and pipes are forced into the receptacles. By pneumatic pressure these are now emptied and the contents carried away in hermetically closed wagons.

Sewers are by no means of recent origin. Before the microscope, before the discovery of bacteriæ and vibriones and long before the germ theory of disease had engaged the attention of science, the ancients well understood the importance of cleanliness. The public baths of Continental Europe, the Cloacæ of Rome, their size and their systematic flooding, all attest the sanitary knowledge of the Romans.

Underground channels, however, are not always constructed for the removal of excretæ. The sewers of Paris convey surface water only. Cesspools upon a gigantic scale abound, the contents of which are carted away from the city and used in fertilization.

Formerly, in England, it was a punishable offense to allow cesspool matter to enter the sewers, and it was as late as 1847 that the first act was passed requiring private drains to enter public sewers.

The water-carriage system is at the present day considered the most efficient mode, and is to a greater extent by far employed than all others. Sewers for the carriage of surface water, excretæ and cesspool matter should be as far as possible self-cleansing. The size, the shape, the internal surface and the inclination of the sewer are all very important. The size is one of great importance; if too large the matters flow on too slowly, if too small the matters fail to enter. This importance is appreciated by engineers who tax themselves greatly to solve this question in the laying of every sewer. Sewers, other things being equal, are efficient in proportion as their size, shape and inclination are adapted for the rapid transit of their contents. The bottom of sewers should not be flat, their internal surface should be smooth, and as all sewers or all parts of the same sewer cannot be perfectly self-cleansing, they should be systematically flooded. The flooding of sewers implies in their construction the introduction of valves or gates by which the sewer may be divided into sections.

The old sewers of Providence were few, they were large, their bottoms were of flag stone or boards and their sides were of rough stone without the use of cement. They were intended for surface drainage only, and the connection of cesspools and privy vaults was a perversion of their intended use. They opened at tide-water or into the Moshassuck river and benefited from 1500 to 2000 people.

The size of the new sewers is based upon the supposition that 30½ feet per acre per minute may be required to be conveyed, and that without entirely filling the sewer. The smaller sewers are vitrified

pipe, and are cylindrical. The larger are constructed of brick and vary as to shape, some being cylindrical, while others are egg-shaped. The smallest sewer is eight inches in diameter; the largest is 66x72 inches. Upon the shape of the sewer is dependent, to a certain extent, the amount of sewage requiring artificial removal. It is obvious that less sediment will be deposited upon a bottom smooth and egg-shaped, than upon one rough and flat.

A storm sewer has been constructed in Washington street. This is circular, is constructed of brick, and is intended for surface drainage only.

Man-holes with perforated covers are placed in most of the sewers, at a distance of one hundred feet.

There are 42.96 miles of sewers in this city, and 2,772 sewer connections. There are twenty-one openings or outlets; fourteen at tide water, six into the Moshassuck, and one into the Seekonk. Not more than 18,000 people are at present benefited, although double that number could be by connecting their estates. The only provision for ventilation is the perforated covers of the man-holes.

The sewers of this city are, to a very great extent, self-cleansing. They cannot be flooded; they can only be washed or cleansed, which is done semi-annually, at such times as deemed necessary by the Water Commissioners and the city engineer.

Aside from the accumulation of sewage in the "dead ends,"—by which is meant that portion of the beginning of a sewer above the first catch-basin—very little sewage is found requiring artificial removal. During the past year,  $6\frac{1}{2}$  miles of sewers were cleaned and forty-seven cubic yards of sewage removed.

The bottom of the opening of the sewer, at tide water, is placed one foot above mean low water mark. Twice, then, during twenty-four hours, may sewage find a free exit, but during the flooding of the tide, this exit is impeded and tide water flows at distances varying from 275 feet in the Brook street sewer to 4,024 feet in the sewer of Dorrance street. There are 1,724 catch-basins in this city, which receive surface water, excretæ of houses, sand and various other matters which are promiscuously thrown into the street. The cleansing of these receptacles demands close attention; if it is neglected, they become centres of filth with a free communication with the street. During the seasons of small rain fall, evaporation of the water is frequently sufficient to open the trap, and then a free communication between the street and the sewer is established. This condition is closely

guarded against by the Board of Water Commissioners, and city engineer, aided by the police. Each catch-basin is examined monthly. If the trap is insufficient, fresh water is introduced; if the sediment is one foot deep, the basin is thoroughly cleansed, and water from the hydrant introduced. During the past year, 6,257 catch-basins were cleansed and 4,395 cubic yards of deposit removed.

The mode of connecting estates with the sewer, and the manner of plumbing houses must be well considered by those who would be benefited rather than injured by the conveniences of a sewerage system. In this matter I believe there is much indifference, and too frequently dangers are encountered and baneful results reaped, instead of the security and blessings possible and intended by the underground receptacles and channels. The security from sewer gas is mainly and justly placed in traps. These, to be efficient then, must be arranged with reference to pneumatic and hydrostatic laws. A trap, in general terms, may be defined as a mechanical arrangement of some portion of the pipe, which shall always be filled with water. The principle in all traps is the same. The water acts as a seal, and intercepts poisons from cess-pools and sewers. The mechanism of traps will vary, depending upon the inventor. Of the traps in general use in this city, the Cudell, is, perhaps, worthy of special notice. In this trap, the water escaping from the sink enters the bottom of a cup which contains a tin ball. The cup is filled, is overflowed; the surplus water passes on through the water pipe, and the ball sinks to the bottom of the cup, preventing the escape of the water, and thus establishing the seal.

In the box trap, the water enters near the bottom and escapes near the top of the box. Bowers' trap and the bottle trap are occasionally used, but possess no advantage over those already described.

The S trap, with complete ventilation, (to be described on a subsequent page,) is, perhaps, the most efficient of all. The S trap, without ventilation, is, to a greater extent employed than all others. Traps of whatever form should frequently be examined and all particles of matter found in them removed. This examination should have reference, not only to cleanliness, but to the efficiency of the trap, as well. It is sometimes found that traps which have been in use a number of years, have become so thoroughly destroyed by elements which have passed through and which have been retained in them, as to allow gas to escape through the walls of the pipe. They become honey-combed and are sources of danger.

By an ordinance of the city, it is required that every drain shall be laid, and every sewer connection shall be made under the guidance of a licensed drain layer. It is also required that every drain, before entering the sewer shall be trapped, that the drain shall be continued to the top of the house, or be made to enter a flue, and that there shall be a down spout communicating with the drain back of the trap. Drain layers obtain their licenses from the Board of Water Commissioners, and are required to give bonds. The S trap is universally used in the drain.

Experiments readily determine that this required trap may either be emptied, or sewer gas may be forced through it. It will be emptied when the sewer is full, or its contents so great as to flow above the opening of the drain. Sewer gas will be forced through the trap when, from some obstruction, the contents of the sewer are unable to escape. The falling of a large quantity of rain, in a short time, rapidly fills the sewer, while the flooding of the tide prevents the free egress of the sewage material. Thus, at times, the trap becomes inefficient. If it is emptied the sewer is ventilated into the drain, which is by law continued to the top of the house, or is made to enter a flue. The drain also has free communication with the down spout or water conductor. The direction of gases in the drain will much depend upon the temperature of the air in its continuations, the current being in the direction of the heated air. In a climate as variable as ours, it is obvious that the direction of the current will not be continuous. During the cold portions of the year, the gas will escape principally at the top of the house; during the hot season the current will be through the water conductor, while during other portions of the year the currents will vacillate, depending upon the diurnal and nocturnal variations.

The continuation of the drain should be of large size, its top should invariably be open, and it should be conducted to the highest practical point. The practice of entering the kitchen flue, is, I believe, poor. It is true, during the cold portions of the year, the heat of the chimney will produce free ventilation, and cause the noxious gases to escape at the top, but during the warm portions, when the furnace is no longer required, when the use of the gas stove becomes general, and when the currents vacillate, the danger of ventilating the sewer into the house through the chimney is not to be lightly considered. It has of late been recommended to conduct the pipe inside the chimney to its top. This, it seems to me, is an excellent method. In winter,

free ventilation is insured; in summer, the residences escape from this source the danger of sewer gas. M. Carey Lea, Esq., of Philadelphia, recommends that a flat stone be laid upon the top of the chimney, with openings upon the sides for the escape of smoke. This in no way interferes with the draught of the flue, while the possibility of the entrance of sewer gas is made very small. In this connection it may be observed that the relation of the top of the chimney and the windows of observatories is such that the contaminated air will be blown into the latter. The dangers from this source are slight. The currents at this elevation are strong, and the cupola is only an occasionally inhabited portion of the mansion. Moreover, it is obvious that the danger from this source can be no greater by carrying the pipe to the top of the chimney, than by entering the kitchen flue, while the liability of the escape of sewer gas through fire-places and openings into the flue is reduced to a minimum. It may be urged that water conductors act as ventilators to drains, and that the mode employed and recommended is not required. It is true water conductors ventilate drains, and with the inefficient trap already described, a direct communication with the sewer is established. The perfection of this mode of ventilation, however, is inferior to that already considered, and, moreover, the difference in the height of houses in cities renders this mode still more objectionable. For the height of buildings of one estate may be such that the gas escaping through water conductors will be wafted directly into the windows of an adjoining estate, or into those of other buildings of the same estate. Water conductors, also, frequently composed of wood, allow of the escape of sewer gas at various points, and the open windows of successive stories admit the impure air to sleeping apartments. Water conductors should not connect with the drain.

The inefficiency of the trap required by law, the mephitic gases of the drain incident to the conveyance of its own contents, and the uncertainty of the direction of the currents, render other preventive means imperative. This security is sought by traps placed immediately beneath water-closets, sinks, set bowls, &c. The large size and open top of the main already advised are essential, not only for ventilation, but without these precautions nothing can be gained by the additional system of traps.

If the main be small and sealed at the top, the escape of water from an upper tenement will empty the traps in a lower, and the escape of water from a lower tenement will empty the traps in an upper.

If the pipe be small and open at the top, the escape of water from an upper tenement will open the traps of a lower. If the main be large and open at the top, these dangers are avoided, unless by a combination of circumstances a number of pipes in an upper tenement should be suddenly opened, sufficient to fill the main pipe. In this event, the traps in the lower tenement would, of course be opened. This possible danger may be avoided by ventilating the trap. A ventilator should pass from just below the trap, and enter the main above all other connections, or be conducted to the top of the house, at the option of the owner.

The inefficiency of the trap regulated by law may in the judgment, of the writer, be remedied by a double trap with a ventilator between. In this event whenever the trap nearer the sewer is emptied, the other trap is by the ventilator protected, and in case of regurgitation of sewer gas through the first trap the ventilator will protect the second.

As already intimated, about one-fifth of the population of this city is, and a little more than one-third could be, benefitted by the sewerage system.

For the large majority, therefore, privies and cesspools must answer the demand. The city ordinance requires that every privy vault shall at least be emptied once in each year, and that between December 1 and May 1. It also provides for the removal of such contents during other portions of the year, if permission be obtained of the Superintendent of Health, and by the same ordinance thorough disinfection of privy contents is required. There is no such provision for the emptying and cleansing of cesspools. A cesspool may indeed be emptied and cleansed at the discretion of the owner at such times as permitted by law or whenever permission may be obtained from the Superintendent of Health. Should a cesspool become a nuisance and deemed by the Superintendent of Health dangerous to the public health, the Board of Aldermen may order such a receptacle emptied and cleansed.

These ordinances are much more noted for their breech than for their observance.

The fact is, people are indifferent to such matters. Complaints are not made to the proper authorities and great masses of animal matter exist all over the city putrefying and producing the baneful results incident to such putrefaction.

There is no law regulating the mode of the construction or the materials to be used in the making of privy vaults. The idea and inclina-



tion of each is a law unto himself. Frequently these vaults are not impervious to fluids and the soil in the immediate vicinity is saturated with the excretæ of the intestines and kidneys. Wells in the vicinity are of course contaminated. If the distance is short the evidence of the communication is apparent to our senses; if the space is greater, the chemist is satisfied nevertheless that privy contents have leached into the well.

Percolation through the soil may remove coloring matter, matters suspended, and odoriferous emanations but matters in solution pass on. If the distance is short and the soil becomes thoroughly saturated, the atmosphere in our cellars becomes contaminated, and now added to other dangers, is that of poisoned air within our dwellings.

Privy vaults should be cemented or made of some material impervious to fluids. They should not receive surface drainage; the ordinance regulating their emptying and cleansing should be rigidly enforced and they should be frequently and thoroughly disinfected.

The importance of disinfection should not be overestimated, and the mistake of depending upon disinfection to the exclusion of cleanliness must not be committed. A gallon or two of a solution of carbolic acid or a few pounds of chloride of lime cannot destroy the poisonous properties of barrels or hogsheads of putrefying privy contents. Neither can immunity from these dangers always be assured by the absence of unpleasant odoriferous emanations or by the substitution of one odor for another. Frequently, with that which is offensive to the olfactory sense, poisonous odorless gases exist.

Cesspools are an abomination and their abolition should be as speedy as possible. Legislation is required compelling the connection of all estates with the sewer when practical and the doing away with all cesspools upon such estates.

The option of the owner governs in the constructions of cesspools. Sometimes a barrel is placed in the ground into which pipes terminate. Sometimes the excavation is loosely covered with boards and sometimes the sides are made of loose stones without the use of cement. Into these receptacles a large amount of matter enters, the fluids percolate the soil, the semi-solids are caught and retained in the interstices, putrefaction ensues and gases incident thereto result. Cesspools should be removed as far as possible from dwellings and wells and their coverings should prevent the escape of gases.

Pipes of all sizes and composed of different materials are used in the connection of estates with cesspools. Frequently the owner

deems himself sufficiently versed in the science and art of plumbing to make the required connection, without the expense of a plumber. Wooden pipes, many times too large, are used which soon become inefficient and allow the fluids to escape before they reach the cesspool. I have known of iron and gas pipes of various sizes to be employed, the smaller fitting into the larger without any regard to tight joints, and all laid at such an angle that regurgitation sometimes occurred, when the sides and bottom of the cellar were saturated with cesspool matter. It is obvious that this is wrong, and the remedy is plain enough.

Cess-pools should be ventilated. This is almost never done. Indeed, when it is, a wooden pipe is frequently conducted from the cesspool outside the house as far as the windows of the second story. Wooden pipes are unsuitable, they easily become imperfect and gases escape which find entrance through the windows in the vicinity.

The ventilators should be perfect and they should be conducted to the top of the house. Traps, then, should be placed immediately under every sink, wash-basin, set-bowls, &c., and the syphonage or emptying of these rigidly watched and prevented by the means already described.

Tenement houses in various portions of the city are very often unprovided with any trap whatever and the gases from the cesspool find free circulation in all parts of these dwellings. Here the inhabitants live frequently in a location unhealthy by nature but rendered one hundred times more so by the mephitic gases which they in their ignorance respire with all the freedom of the purer air of good hygienic surroundings, or indeed, should the emanations become unbearable, disinfectants are brought into requisition, frequently enough with no good, save the substitution of one odor for another. The land-holders too are indifferent, and actuated sometimes by ignorance and sometimes by penuriousness, refuse the proper remedies and argue at length with the sanitarian.

Legislation is required that these houses, occupied by the ignorant and poor, should be properly connected with cesspools and every owner should be held to a strict account for every neglect in this particular. In a matter involving public health, no man should be arbitrary and have a right to say what shall and what shall not be done on his particular piece of property. In such matters intelligent legislation should rule. Through the imperfect sewer and cesspool connections also, the dwellings of those better-to-do and the mansions

of the rich are not always free from the gases in question. If the quantity is not as great, still insidiously may the poisonous odorless emanations enter; and frequently, after the prevalence of zymotic diseases, it is, that the plumber first discovers that some portion of the dwelling is contaminated with the sewer gas.

In recapitulation, allow me to suggest that the remedies for the present imperfect sewer connections are as follows :

*First.*—Place two traps in the drain, with a ventilator between, which shall be continued to and above the roof.

*Second.*—Never connect a water conductor with the drain.

*Third.*—Continue the drain of large size to the highest practical point. The mode of continuing it inside the chimney to its top is excellent.

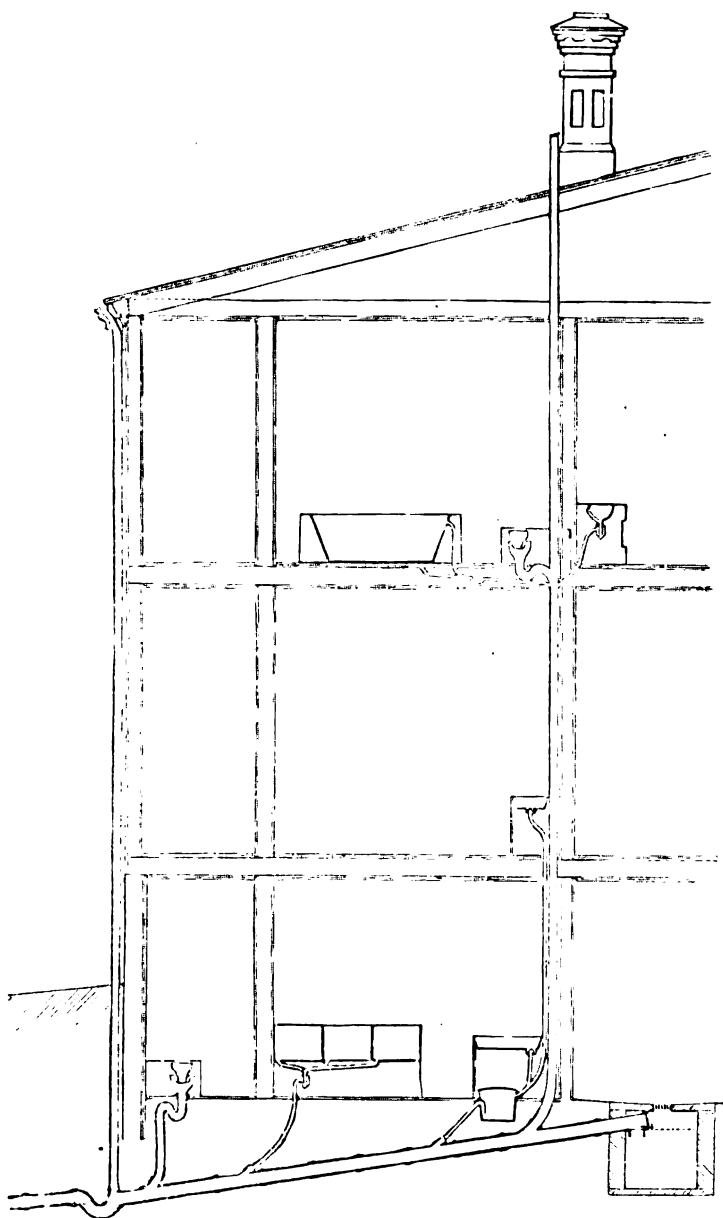
*Fourth.*—The top of the main should invariably be open.

*Fifth.*—Continue a ventilator from just below each small trap placed under water-closets, sinks, set-bowls, &c., and terminate it in the main above all other connections.

It may be said that to follow this advice involves great expense. It is not so. Even if it did, it would have nothing to do with its importance.

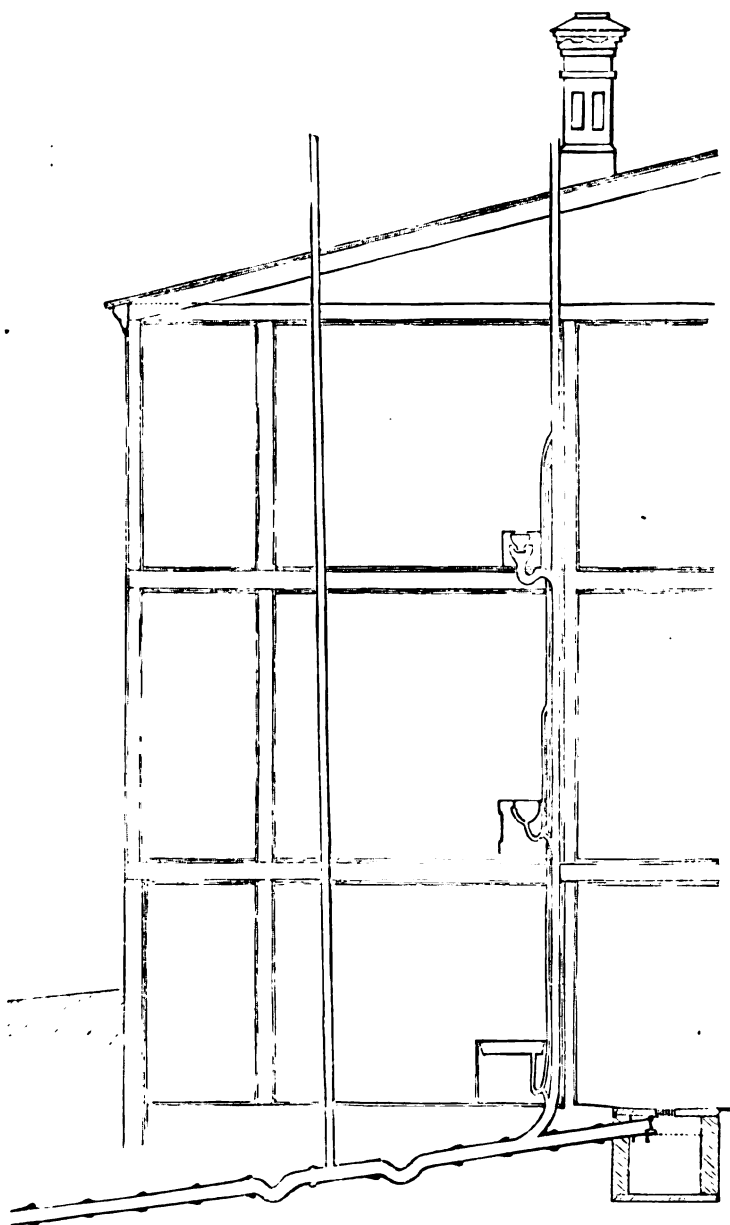
If it can be argued that the suggestions made will not insure perfect protection, it must at the same time be admitted that the present mode is imperfect and that the mode advised is an improvement. It is an important matter, and should sanitarians devise a more perfect mode than that now required by law and urge the Board of Aldermen to enforce its adoption, they would accomplish results the good of which would not only be immediate but would continue to exist and prove a boon to future generations. It is high time that the public and their representatives in legislative bodies were made to understand the importance and necessity of cleanliness, especially in populous places.

I gratefully acknowledge the courtesy of S. M. Gray, City Engineer, and O. F. Clapp, Assistant City Engineer, in cheerfully furnishing valuable information concerning the sewers of this city.



House Drainage and Ventilation of Drains, as required by  
City Ordinance, Providence, R. I. See page 291.





House Drainage and Ventilation of Drains, as recommended in the paper "Disposition of Excreta," &c. See page 293.



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# COLOR-BLINDNESS,

BY

WM. SHAW BOWEN, M. D.,

OF PROVIDENCE, R. I.,

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## COLOR-BLINDNESS.

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The attention of the public has of late been directed to the subject of color-blindness, and to a large portion of the community it comes with the freshness of novelty.

That a certain proportion of individuals are deficient in the power of recognizing and discriminating certain of the primary hues of nature has been known for some years by a limited number of the educated, but it may be said that the infirmity has attracted but little thought outside the ranks of science.

It is the purpose of the writer to very briefly refer to the subject and to point out its practical bearing, without going beyond the citation of previously published opinions. It was in the beginning of this century that Dr. Young, in England, propounded the theory of light being confined to three primary colors determined by the special sense we call sight. These colors are red, green and violet, and by their combinations, in different proportions, the various colors in infinite variety are produced. Primary colors are determined by comparison of the equation of color by those with normal eyes, and those who are color-blind. "Equations of color-blindness are differentiated by the absence of one or more elements of color, the relationship of which to known colors can be determined." Color-blindness may therefore be determined as an insensibility to the colors red, green and violet, or an imperfect perception of one or all of them. The more common form in the human race is blindness for red. The red usually appears dark and is taken for green, and violet takes the place of pink. Brown, purple or orange are observed imperfectly or with the utmost difficulty. Blue and yellow are the easiest of recognition, the latter being always recognizable. Next in frequency is green-blindness, which may be connected with red-blindness, and drab is the color confounded with it. According to Wilson, common color-confusions are red with green, brown with green, and blue with green. Dr. Wilson,

of Edinboro, originated the term color-blindness. At this Dalton, an English chemist, published an account of the condition of his own eyes in 1798, he being unable to distinguish pink from blue. The older writers have called the condition Daltonism in consequence. Occasionally a case has been reported of a person who has no sense of color whatever, the eye being otherwise healthy. To such a person objects appear like those in a photograph, light and shade only. The perception of colors is naturally regulated by the quality of light, artificial light often-times throwing out red and green undetermined by natural light. Color-blindness is frequently hereditary and seems to be favored by consanguinity. It is usually congenital except when acquired through disease of the optic nerve or retina, and remains through life. A case cited by an English writer seems to afford an exception of acquirement. Without any disease of the eye or known injury, "a locomotive engineer, after an accident caused by his non-recognition of the danger signal red, confessed that his color-power, previously perfect, had gradually disappeared, and that being sensible of the loss he had determined to give up his situation prior to the occurrence of the accident." The man had been previously examined for color-blindness and found qualified for service in his position. The eye was in a healthy condition.

In certain hysterical affections color-blindness has been observed, it is then only temporary in duration. When congenital, it is usually unknown to the subject unless especially looked for. The proportion varies according to nationality and climate. According to the latest investigations, the percentage among males is from three to five per cent, and among females a little less than one per cent. It is more common in the uneducated classes, and this fact shows the necessity for carefully testing the eyes of all occupying positions in which use of the eyes in distinguishing colors accurately is indispensable. The detection is ordinarily easy if a few simple precautions are followed. A person when asked to name colors of any shade will do so if he has a knowledge of their correct names, but it is not infrequent that in congenital cases a knowledge of the names is absent. Such a person often distinguishes by the difference of shades, that is, difference in quantity of white light reflected. It may be seen, therefore, that the defect escapes detection unless many different colors are used in the test. Others often use the names of colors freely but do so not conveying the same meaning, and inevitable confusion results from an examination. Various physiologists and specialists on the eye have

studied the subject closely and have published the result of their researches with methods for ascertaining the presence of the defect. The spectroscope, colored letters and papers, silks, in fact, a great variety or ways, all more or less defective when brought into practical use.

The most approved method is that of Prof. Holmgren, of the University of Upsala, Sweden. He first used skeins of colored Berlin worsted. A variety of shades of the same color, not less than five of each, are placed on a table, and the person whose color-sense is to be tested is requested to select and place together all shades of the same color, beginning with those of red. If there is inability to determine accurately it will at once be apparent. The examination is ordinarily conducted with rapidity, a few minutes only being required. Dr. Jeffries has been one of the most indefatigable investigators in this country and he has carefully tested many thousand eyes in reference to the perception of colors. Through his efforts the subject has become one of interest to railway and steamboat managers, and the eyes of school children, in many of the large cities have been tested. Dr. Jeffries has popularized, as it were, the abnormality and has shown conclusively its dangers.

In every day life the evils are confined to the personal annoyance of the individual in whom the defect exists. In the incurable cases the occupation must be of such a nature as to preclude the necessity of discriminating shades of color. Many who are color-blind, however, by the careful observation of the effects of light, as previously mentioned, are enabled to handle worsteds and even apply and blend pigments, but this is done somewhat at random and certain effects are impossible of attainment.

A gentleman recently informed the writer that he is obliged to inquire which is the green light of the horse-car that passes his home. Amusing stories have been chronicled concerning the color-blind, and one of Dalton, who was one of the original investigators of the condition, may not be amiss. After he had published an account of his own condition he attracted general attention and was presented at Court. In the Scientific London, 1874, is described his presentation and the difficulties he raised over the customary Court costume then essential. "Firstly, he was a Quaker, and would not wear a sword, which is an indispensable appendage of ordinary court-dress. Secondly, the robe of a doctor of civil laws was known to be objectionable on account of its color,—scarlet,—one forbidden to Quakers. Luck-

ily it was recollected that Dalton was afflicted with the peculiar color-blindness that bears his name, and that, as the cherries and leaves of a cherry tree were to him of the same color, the scarlet gown would present to him no extraordinary appearance. So perfect, indeed, was the color-blindness, that this most modest and simple of men, after having received the doctor's gown at Oxford, actually wore it for several days in happy unconsciousness of the effect he produced upon the street."

Dr. Jeffries quotes a case as follows, it is that of a gentleman who says: "As far as I can tell, the following expresses my experience as to colors: Yellow is the brightest color; blue, nearly as bright. These two are the only ones I see distinctly in the rainbow. Red I can distinguish when bright; but delicate shades I confound with stone-color or gray. Green I have no distinct conception of. According to its different shades, it appears black, brown, red, yellow, blue and gray. I cannot distinguish, at any distance, the ripe cherries on a tree, or strawberries, from their leaves. I have no conception of what is meant by complementary colors, or of the agreement of different colors when blended together; as, for instance, what kind of a carpet accords with red curtains in a room. With regard to my want of perception of green, it appears to me that the blue and yellow rays neutralize each other, and, when in equal proportions, constitute what is really no color, varying all the way from a light drab to a dingy black. When the blue rays predominate, it appears a blue drab; and, when the yellow rays are in excess, it appears a yellow drab. When the blue and yellow are properly blended, a lady's dress of green silk appears to me very similar, and no more glaring than a drab silk. The dry dirt of the street I could equally suppose to be green. I also confound red and brown, frequently. I could not distinguish between treacle and blood spilt in a road by day light."

A boy fifteen years of age was brought to me by his parents, who were in a state of apprehension as to the future of his eye-sight. He would pick green berries with the ripe, and green fruit, as well. His father, ascribing it to carelessness, solely, punished the boy frequently, but, of course, without avail. The explanation was soon given that he was color-blind for certain hues. In the case of railway employés and all those who are called upon to so accurately determine colors as to jeopardize human life in event of failure to be exact, the question becomes one of vital importance, and the condition is no longer one to be considered as affecting the individual alone. The importance of

adopting strict precautions has long been recognized by foreign governments. On the continent of Europe, nearly all the different powers provide laws regulating the inspection and registration of all connected with railroads, who are by any possible chance called upon to recognize signals, and unless the required examination is satisfactorily passed, the person is considered ineligible. The reports published of this work are exceedingly interesting. "The last report of Dr. Favre, of the Lyons Mediterranean Railroad, (France,) gives the results of examinations of railroad employés since 1855. It shows also how more careful tests discover a greater proportion of color-blind persons. Dr. Favre, up to 1855, had examined about 5,000 candidates for railroad work, and rejected more than fifty for being *red-blind*. He had not, unfortunately, kept accurate records, for from 1855 to 1864, he noted eight color-blind only, which number does not correspond with the number of men examined. From 1862 to 1872, among 1,196 persons examined, he refused certificates to fourteen color-blind, who could not tell red. From May, 1873 to July, 1875, his examinations were more exact; and he found, among 1,050 persons seeking railroad employment, ninety-eight made decided blunders, or hesitated; and ten were rejected for being red-blind."

"Dr. Lederer found sixty-three color-blind persons among 1,312 men of the Austrian navy, or 4.8 per cent. Dr. Fontenoy found thirty-one color blind, out of 1,084 railroad employés of Denmark.

Prof. Donders, of Utrecht, Holland, found, among 2,300 railroad employés, 152 color-blind. Dr. Krohn, in Finland, found among 1,200 railroad people, sixty, or five per cent., color-blind." Examples may thus be given, *ad finitum*, of the occurrence of color-blindness among those employed in public service. The researches among children at school are equally fruitful in results. "Dr. Daac, of Kragerö, Norway, found amongst 205 school-boys, 4.88 per cent., color-blind. Dr. Cohn detected ninety-five among 2,429 school-boys of Breslau, or four per cent.; Dr. Magnus found among 3,273 school-boys, 3.5 per cent., color-blind." And Professor Holmgren, in the course of his very extensive investigations in Sweden, found, "among 32,165 males, 1,019, or 3.17 per cent., color-blind." In this country investigators have gone over the ground in many of the large cities, with painstaking zeal, and have published the results. The labors of Dr. Jeffries have been the most fruitful in demonstrating the extent of the peculiar optical condition. He examined 10,387, and found 431 color-blind—a high percentage, indeed, somewhat beyond the average.

It may be said, however, that the great skill and knowledge displayed by this eminent scientist, doubtless discovered certain obscure cases that ordinarily would escape detection. Dr. Jeffries considers the percentage is higher among American-born children, and that his observation does not bear out the statements of foreign statisticians that the more ignorant and degraded classes are more prone to color-blindness. The infrequency of the infirmity among females is a well known fact, and the subject is now undergoing investigation, without, however, any satisfactory explanatory results. Dr. Cohn "found among 1,061 Breslau school-girls, *none* color-blind." Dr. Magnus found in the same city "but one color-blind girl, among 2,216." Prof. Holmgren "reports from Sweden, having found, among 7,119 females of all ages, nineteen," or 0.26 per cent., color-blind. Dr. Jeffries inspected 7,942 females, and found four only, lacking in color perception. The writer has examined 842 male eyes in reference to the color sense, and, although the number is too limited to give valuable results, the percentage proved somewhat less than Dr. Jeffries examinations indicated.

Of the 842, nearly two-thirds were adults, and the eyes were, in a few cases, in an abnormal condition, aside from the color defect. One hundred and nine men were near-sighted, and eighty-two were hypermetropic, or over-sighted. Sixty-seven men were wearing spectacles for old sight; twenty-seven were color-blind out of the total of 842 examined; the percentage thus being less than four per cent. The red-blind numbered fifteen; the green-blind, eight. The Holmgren method, with colored worsteds, was employed. By request of the efficient superintendent of the New York, Providence and Boston railroad, J. B. Gardiner, Esq., an examination by the writer, of the knowledge of colors by those of the employ  s called on to recognize signals, either by night or day, is being made, and is at present uncompleted. In Massachusetts the examination has been very thorough, and the eyes of all train and switch men tested. The actual changes taking place in the eye that are recognized as the cause of color-blindness, are usually such as are only observed by aid of the microscope and possess little interest to the general reader. As previously mentioned, in a large majority of cases, the condition is incurable, although something is to be done in the way of educating the persons afflicted to discriminate by attending to light and shade. When all connected with railways and steamboats are known to be free from the defect, a well proved source of danger to life and limb will be averted.

## APPENDIX.

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# THE REGISTRATION LAW OF RHODE ISLAND.

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### GENERAL STATUTES, CHAPTER 77.

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#### OF THE REGISTRATION OF BIRTHS, DEATHS AND MARRIAGES.

(As amended June, 1875; April, 1878, and March, 1879.)

SECTION 1. The town clerks of the several towns, or in lieu thereof, any person whom the board of aldermen of any city, or the town council of any town, may appoint for that purpose, are hereby authorized and required to obtain, chronologically record and index, as required by the forms prescribed by the third section of this chapter, all information concerning births, marriages and deaths, occurring among the inhabitants of their respective towns; and on or before the first Monday of March, annually, to make duly certified returns thereof to the Secretary of the State Board of Health, for each year, ending on the thirty-first day of December, accompanying the same with a list of those individuals, required by law to make returns to him, who have neglected the same, and with such remarks relating to the object of the law, as they may deem important to communicate.

SEC. 2. The Secretary of the State Board of Health shall receive the returns made in pursuance of the preceding section, and annually make and publish, not exceeding one thousand copies, a general abstract and report thereof, in form as prescribed by section third of this chapter. The Secretary of State shall then cause said returns to be arranged, full alphabetical indices of all the names to be made, the whole to be bound in convenient sized volumes, and carefully preserved in his office, for which he shall receive the sum of fifty dollars.

SEC. 3. The blank forms required to carry out the provisions of this chapter shall, on application, be furnished by the Secretary of the State Board of Health, to clergymen, physicians, undertakers, town clerks, clerks of the Society of Friends, and other persons requiring them, substantially after the following forms, viz: The record of a birth shall state the date and place of birth, name



and sex of the child, whether living or still-born, the name and surname, color, occupation, residence and birth-place of the parents, and the time of recording, so far as the same can be ascertained. The record of a marriage shall state the date of the marriage, place, name, residence, and official station of the person by whom married, names and surnames of the parties, age, color, occupation, and residence of each, condition (whether single or widowed), what marriage, if second, third, or other marriage, the occupation, birth-place, and name of their parents, and the time of recording, so far as the same can be ascertained. The record of deaths shall state the date of death, name and surname of deceased, the sex, color, and condition (single or married), age, occupation, place of death, place of birth, names and birth-place of parents, disease or cause of death, and the time of recording, so far as can be ascertained.

#### OF MARRIAGES.

SEC. 4. Every Society of Friends, clergymen and all others, authorized to join persons in marriage, shall make a faithful record of every such rite performed by them, in manner and form aforesaid, and return the same on or before the second Monday of every month, for the last preceding month, to the clerk of the town in which such rite shall have been performed; and no marriage shall be solemnized until the parties shall have signed and delivered to the authority about to solemnize it, or to the clerk of a Society of Friends, a certificate containing the information required for the record of a marriage, as prescribed in the third section of this chapter.

#### OF BIRTHS.

SEC. 5 The clerk of every town, or in lieu thereof, some person or persons whom the town council of any town, or the board of aldermen of any city, shall appoint for the purpose, shall, annually, in the month of January, collect the facts required by section third of this chapter, in relation to all children born in the town during the year ending the thirty-first day of December next preceding, and for each full report of a birth so obtained, shall receive therefor such compensation as the town council or the board of aldermen of their respective towns or cities shall determine, in lieu of such compensation as may now be fixed by law. (By Chapter 782 of the Public Laws, the cities of Providence and Newport are exempt from the provisions of the preceding section, in relation to time of collection and compensation.)

#### OF DEATHS.

SEC. 6. "Whenever any person shall die or any still-born child shall be brought forth in this State, it shall be the duty of the physician attending at such bringing forth or last sickness, if any physician so attended, within forty-eight hours after such death or bringing forth, to leave with the family, if any, or person having the care of the deceased or the person bringing forth such still-born child, or to give to the undertaker or person who conducts the funeral, a certificate stating, in case of a death, the name of the deceased, the date of the death and the disease or cause of the death, and in case of the bringing forth of a still-born child, the date and the cause of such child being brought forth still-born."

## OF UNDERTAKERS.

SEC. 7. There may be appointed by the town authorities of every town, a sufficient number of persons to act as undertakers, removable at the pleasure of the authorities.

SEC. 8. The undertaker, or the person who shall conduct a funeral, or who shall bury or deposit in a tomb, or who shall remove from this State or otherwise dispose of the remains of any deceased person or still-born child, shall first obtain the physician's certificate required by Section 6 of this chapter, if a physician was in attendance upon such person who has deceased, or the person bringing forth such still-born child, and shall return the same, together with his own certificate of the facts required by Section 3, as hereby amended, on or before the second Monday of the next succeeding month to the clerk of the town where such death or bringing forth took place.

SEC. 9. Any town may enact municipal laws, more effectually to attain the objects herein contemplated: *Provided*, they do not conflict with the main and specific object of this act, viz: to procure the most perfect registration.

## OF FEES.

SEC. 10. The town clerks, or persons recommended and appointed as aforesaid, shall receive for each record of a death made and returned as required by law, and for each record of a marriage made and returned as required by law, twenty cents, to be paid to them out of their respective town treasuries; *Provided*, that the yearly compensation to be paid out of the town treasury as aforesaid, to any one town clerk or person appointed as aforesaid, who shall faithfully perform the duties prescribed by this chapter, shall not be less than five dollars. Undertakers and others making returns of deaths as required in Section 8 of this chapter shall receive for each full report of a death made to the town clerk, five cents in the cities of Providence and Newport, and ten cents in the other towns of the State.

SEC. 11. If any clergyman, physician, undertaker, town clerk, clerk of any meeting of the Society of Friends, or other persons, shall willfully neglect or refuse to perform any of the duties imposed on, or required of him, by this chapter, he shall, at the discretion of the court trying the case, be fined not exceeding twenty dollars for each offence, one-half thereof to the use of the town in which the offence shall occur, the other half to the use of the person who shall complain of the same.

SEC. 12. In order that it may be more surely ascertained that no clergyman, physician, coroner, undertaker, or clerk of the Society of Friends, neglects to make the returns specified in this chapter, each of the said parties shall cause his name and residence to be recorded in the clerk's office of the town where he resides.

SEC. 13. No letters of administration, or letters testamentary, shall be granted by any court of probate, upon the effects or estate of any person, until the death of such person, or the facts from which the same is presumed, shall be duly certified, as near as may be, to the town clerk, in order that the same may be duly registered according to the provisions of this chapter.

SEC. 14. The person appointed as provided in Section 1 of this chapter, shall be entitled to have the custody of all records of births, deaths or marriages of the town or city for which he is appointed, whether made under the statute now in force or any former statute, and a certificate signed by him as town or city registrar certifying that any written or printed statement of any marriage, birth or death is a true copy of the record in his custody, shall be admitted as *prima facie* proof of such marriage, birth or death.

SEC. 15. Births, marriages and deaths, of non-residents, shall be distinguished from those of residents, in the returns by being arranged separately.

SEC. 16. The Secretary of the State Board of Health may, from time to time, vary the forms of returns, and require such additional information as he may consider necessary, to effect the object of this chapter.

SEC. 17. *Repealed January Session, 1878.*

SEC. 18. The town clerks or other officers appointed under this chapter, to collect, record and return the births in the several towns, shall receive fees therefor as follows: For collecting the facts required in relation to births, fifteen cents each; for making record and return of these facts as required by law, twenty cents each for the first fifty entries in each calendar year, and ten cents each for each subsequent entry and return.

SEC. 19. The returns required to be made by clerks of the supreme court, in relation to divorces, to the Secretary of the State Board of Health, or a prepared abstract thereof, shall be published in the annual report upon the births, marriages and deaths in the State.

## PUBLIC LAWS, CHAPTER 680.

### AN ACT TO ESTABLISH A STATE BOARD OF HEALTH.

(As passed April 12, 1878, and amended March, 1880.)

*It is enacted by the General Assembly as follows:*

SECTION 1. The Governor, with the advice and consent of the Senate, shall appoint six persons, two from the county of Providence, and one from each of the other counties, who shall constitute the State Board of Health. Of the persons so appointed, at least three shall be well educated physicians and members of some medical society incorporated by this State. The Governor may remove any member for cause, at any time, upon the written request of two-thirds of the board.

SEC. 2. The six persons first appointed shall be appointed for one, two, three, four, five and six years, respectively, and hereafter, the Governor, with the advice and consent of the Senate, shall appoint one member of the board annually, for the term of six years from the first day of July. Any appointment to fill a vacancy shall be for the remainder of the term.

SEC. 3. The board shall take cognizance of the interests of life and health among the citizens of the State; they shall make investigations into the causes of

disease, and especially of epidemics and endemics among the people, the sources of mortality, and the effects of localities, employments, conditions and circumstances on the public health, and shall faithfully do all in their power to ascertain the causes and the best means for the prevention of diseases of every kind in the State. They shall publish and circulate, from time to time, such information as they may deem to be important and useful for diffusion among the people of the State, and shall investigate and give advice in relation to such subjects relating to the public health, as may be referred to them by the General Assembly, or by the Governor when the General Assembly is not in session.

SEC. 4. The State Board of Health shall also investigate the subject of diseases among cattle or other animals, and perform all the duties which have been delegated to the Board of Cattle Commissioners, in chapter 76, of the General Statutes of the State.

SEC. 5. Section 3, of chapter 76, of the General Statutes, is hereby repealed, and the Board of Cattle Commissioners, heretofore constituted under authority of said section, is hereby abolished.

SEC. 6. In every section of chapter 76, of the General Statutes, where the word "commissioners" occurs, it shall be construed to mean State Board of Health.

SEC. 7. The State Board of Health shall receive the returns of births, marriages, deaths and divorces, and shall prepare the annual report upon the registration of the same as now required by law; but after the report is prepared, the returns shall be deposited in the office of the Secretary of State, to be bound and indexed by him as heretofore.

SEC. 8. Wherever the words "Secretary of State" occur in sections 1, 2, 3, 16 and 19, of chapter 77, of the General Statutes, they shall be construed to mean Secretary of the State Board of Health, and in the sixth line of section 2, of said chapter, the word "he" shall be construed to mean Secretary of State. Section 17, of chapter 77, of the General Statutes, is hereby repealed.

SEC. 9. The board shall meet in the city of Providence once in three months, and as much oftener as they may deem necessary. No member of the board, except the secretary, shall receive any compensation for his services; but the actual personal expenses of any member, while engaged in the duties of the board, shall be paid by the State.

SEC. 10. The board shall elect a well qualified physician as their secretary, who shall be *ex-officio* a member of the Board, the Commissioner of Public Health, and State Registrar of Vital Statistics; but shall not thereby vote on any question upon which he is personally interested, or be entitled to any additional compensation for mileage or expenses.

SEC. 11. The secretary shall perform and superintend the work prescribed in this law, and such other duties as the board may require, and he shall receive such salary, not in excess of twelve hundred dollars per annum, as the board may determine. He shall hold his office at the pleasure of the board, but may be removed at any regular meeting by a majority vote of the members thereof.

SEC. 12. The Governor shall provide a suitable office for the board in the city of Providence, and the actual expenses of the board and of the members thereof, when certified by the chairman and approved by the Governor, shall be paid from the treasury of the State.

SEC. 13. The board shall make a report in print to the General Assembly, annually, of its proceedings during the year ending on the thirty-first day of December next preceding, with such suggestions in relation to the sanitary laws and interests of the State as they shall deem important.

SEC. 14. All acts and parts of acts inconsistent herewith are hereby repealed.

SEC. 15. The several town councils and boards of aldermen shall still be *ex-officio* Boards of Health in their respective towns, as is now by law provided. *Provided, however,* that the city council of any city may appoint a Board of Health for such city, which shall have all the powers and duties now conferred by law upon the board of aldermen as a Board of Health.

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#### PUBLIC LAWS, CHAPTER 794.

SECTION 3. The secretary of the said board shall make inquiry from time to time, of the clerks of town and local boards of health, in relation to the prevalence of any disease, or knowledge of any known or generally believed source of disease, or causes of general ill-health, and also in relation to the proceedings of the said boards of health, in respect to acts for the promotion and protection of the public health, and also in relation to diseases among domestic animals, in their several towns and localities respectively; and the said clerks of town and local boards of health shall give such information, in reply to said inquiries, of such facts and circumstances as have come to their knowledge.

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THIRD ANNUAL REPORT  
OF THE  
STATE BOARD OF HEALTH,  
OF THE  
STATE OF RHODE ISLAND,  
FOR THE  
YEAR ENDING DECEMBER 31, 1880.



PROVIDENCE:  
E. L. FREEMAN & CO., PRINTERS TO THE STATE.  
1881.



MEMBERS  
OF THE  
RHODE ISLAND STATE BOARD OF HEALTH.  
DECEMBER 31, 1880.

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DAVID KING, M. D., <i>Chairman</i> .....	NEWPORT COUNTY.
DAVID SMITH.....	WASHINGTON COUNTY.
ALBERT G. SPRAGUE, M. D.....	KENT COUNTY.
OLIVER C. WIGGIN, M. D.....	PROVIDENCE COUNTY.
GEORGE W. JENCKES, M. D.....	PROVIDENCE COUNTY.
THOMAS H. SHIPMAN, M. D.....	BRISTOL COUNTY.
CHARLES H. FISHER, M. D., <i>ex-officio, and Secretary</i> .....	PROVIDENCE COUNTY.



## GENERAL REPORT OF THE BOARD.

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*To the Honorable the General Assembly:*

In conformity with law, the Third Annual Report of the State Board of Health of Rhode Island is herewith presented.

It comprises, in the Annual Report of the Secretary, the statistics of births, marriages, and deaths, during 1879, with extended comments and comparisons of these events; a record of the general proceedings at the meetings of the Board; and an account of the work performed under its sanction or direction, during the year ending December 31, 1880.

It will be proper to say, however, that the Report of the Secretary does not include an account of all the investigations, proposed and prosecuted, to such extent as time and circumstances would permit. These will continue to be pursued as opportunity offers, until such time as a fuller report may seem to be expedient.

Several papers in relation to subjects appertaining to the prevention of disease and the promotion of public health, designed to be presented in this report, were not completed in time for that purpose, and will await a future presentation.

It has not been deemed the best policy, up to the present time, to report the nuisances that have come under the observation of the Board, by complaint or otherwise, and which seemed to threaten the public health or health of a few individuals, as the case might be; as nearly all have been of private character and have been abated by a courteous appeal to individual owners without resort to legal authority, and the parties would deprecate being named to the public. Such as are not abated are still under consideration.

There is a manifestly increased interest in the work of the Board, shown by persons of intelligence and culture, whose interest in the subjects of vital statistics, and general sanitation, lead to personal inquiry or correspondence.

It is apparent to the General Assembly that no extended investigation into the causes of disease, can be prosecuted by order of the Board with any such sum as has been heretofore appropriated for its use. It must be remembered that the expenses of the collection and supervision of the vital statistics, the expenses incurred in the prevention and restriction of contagious diseases among domestic animals, which had prior to the organization of the Board been defrayed through other departments, are now a part of the expenses of the Board, as well as what may be needed for current expenses in the discharge of other duties of the Board.

In the State of Massachusetts, the valuable reports of investigations made under the direction of the State Board of Health, were prosecuted by experts at an expense, in many single cases, exceeding the whole amount appropriated for all purposes in this State.

The various duties of the Secretary of this Board, aside from the occasional *temporary* investigations of sources of disease, demand the full employment of his time. He has however given attention, outside the ordinary hours of the officials of the State, to questions which have relation to the public health, and which will be reported at a suitable time.

Respectfully submitted,

DAVID KING,

*Chairman.*

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## REPORT OF THE SECRETARY.

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*To the Honorable the General Assembly, and the members of the State Board of Health of Rhode Island :*

Herewith the Secretary of the Board respectfully submits his Third Annual Report.

The account of the proceedings of the Board will first be limited to a general sketch of the record of the meetings, as held at different times; a full account in detail not being deemed necessary in this connection.

Farther on in the Report, fuller statements will be made when the work of the Board in relation to the duties connected with the several departments of labor, namely: the investigation of the causes of disease; the collection, classification, tabulation and report of vital statistics; and the supervision of contagious and infectious diseases among domestic animals, is taken up in each special department, for consideration, and an account given of proceedings therein.

In regard to the public health during the year 1880, it may be said that no widespread epidemic has prevailed, although some localities have had severe visitations of scarlatina and diphtheria in an epidemic and malignant form. Judging from the reports of correspondents, cholera infantum has had larger prevalence than during the preceding two or three years, and acute diseases of the lungs were unusually numerous, and of more than average fatality during the earlier cold months of the year.

Remarks at greater length in relation to the prevalence of diseases, and the causes of disease, may be found on a subsequent page.

### MEETINGS OF THE BOARD.

In addition to the annual and regular quarterly meetings of the Board, and adjournments of the same, there were held five special meetings during the year at which business was transacted.

At these meetings many questions in relation to the sanitary interests of the State were suggested and discussed informally; and various communications from the National Board of Health, from State and city boards of health, and sanitary associations of more or less magnitude, were received, read and action taken thereon.

At a meeting held March 5, 1880, after statements made by the Secretary, and a consideration of the circumstances demanding an additional regulation in relation to contagious diseases among domestic animals, the following was adopted as regulation fourth:

All persons having the care or ownership of any horse or other animal suspected by any member of the State Board of Health, or its authorized agents, of having the disease called glanders, or any contagious or infectious disease dangerous to life, shall surrender possession of, or *securely keep*, said horse or other animal, in compliance with the orders of either of the members or agents aforesaid, *officially* emanating from the said State Board of Health, until the nature of the disease in question has been determined by a veterinary expert.

At the same meeting a resolution which had been passed on May 21, 1879, with the request that the Chairman would see that an act to carry into effect the provision of the resolution, was presented to the General Assembly at the May session of that year, was revived with slight changes, in consequence of the failure of the Committee on the Judiciary of the House of Representatives to report at that session in time for the passage of the act, which, with the resolution, had been presented as desired. The resolution was as follows:

*Resolved*, That for the purpose of greater certainty in securing a quorum at every meeting of the State Board of Health, it is desirable that the Secretary be made a member *ex-officio*, and the Chairman is hereby requested to present the said resolution to the Honorable the General Assembly, at the May session of 1879, in Newport.

This resolution, changed in date to January session of 1880, was put in charge of the Secretary to be brought before the General Assembly at that session, with an act which should make the Secretary a member of the Board *ex-officio*, and define the official titles by which his various duties might be known.

In consequence of the action thus taken, the following amendment to section 10, of the act establishing a State Board of Health, was enacted by the General Assembly, March 11, 1880, so that the said section 10, will now read as follows:

SEC. 10. The Board shall elect a well qualified physician as their Secretary, who shall be *ex-officio* a member of the Board, the Commissioner of Public Health, and State Registrar, but he shall not be permitted to vote upon any question upon which he is personally interested, or be entitled to any additional compensation for mileage or expenses.

At this meeting correspondence with the Sanitary Council of the Mississippi Valley and other health boards, and with private individuals interested in plans for the promotion of the public health, were variously considered and acted upon.

The Board had been interested in a resolution which was introduced into the National House of Representatives at Washington, providing for the transmission through the mails at newspaper rates of postage, of all the regular publications of boards of health throughout the United States.

At a meeting held on April 7, 1880, the question came up for further consideration, and the Secretary was instructed to correspond with the Senators and Representatives in Congress from Rhode Island, and request their active interest in and support of the resolution.

The instructions were complied with, and replies were received from all the Rhode Island representation to the effect that the resolution had their entire approval, and that it would receive their hearty support.

The first change in the membership of the Board during the year was that of Hon. Elisha Dyer, Jr., member from Washington county.

The following letter from Col. Dyer is fully explanatory:

PROVIDENCE, April 2, 1880.

*Charles H. Fisher, M. D., Secretary State Board of Health:*

DEAR SIR,—I have this day forwarded to His Excellency the Governor my resignation as a member of the State Board of Health from Washington county.

Increasing cares and responsibilities require me to pass the greater portion of the year away from the county, and I am obliged thereby to remove my residence to the city of Providence.

In parting from the gentlemen of the Board, and particularly yourself, I beg to express my sincere regret at so doing, to thank one and all for the uniform courtesy and consideration that I have always received and to assure them, and yourself personally, that I shall always remember with great satisfaction my connection with the Board from its very beginning, and my hope that it will go on increasing in usefulness and power.

I am, my dear sir, very truly yours,

ELISHA DYER, JR.

At a meeting held April 28, DAVID SMITH, Esq., of Washington county, having been appointed to fill the vacancy occasioned by the resignation of Col. Dyer, was present, and after presentation of commission and engagement, was formally and cordially received in membership.

The following resolution, in relation to the resignation of Col. Dyer, was passed unanimously:

*Resolved*, That the Rhode Island State Board of Health hereby express a sincere regret that events have occurred which have severed the official relations of Hon. Elisha Dyer, Jr., with the Board; and they hereby bear testimony to the warm interest he invariably manifested in the work of the Board, and the kindly courtesy and uniform urbanity of manner evinced at all the meetings, and to the members individually.

Plans for uniform methods of investigation and modes of dissemination of useful knowledge among the people, applicable to all State boards of health, were discussed at some length at this meeting.

#### ANNUAL MEETING.

The first Wednesday in July having been established as the day for the annual meeting of the Board, a meeting was accordingly held on that day.

The second change in the membership of the Board occurred at this time, and was occasioned by the termination of the term of service of W. T. C. Wardwell, Esq., of Bristol county.

At this meeting Thomas H. Shipman, M. D., of Bristol county, having been appointed by the Governor to fill the vacancy in the membership from that county, appeared, and upon presentation of credentials was cordially received by the older members.

A summary report of the work of the Secretary in each of the departments during the previous six months was made.

An account of some of the abattoirs, and of the materials used in some of the manufacturing establishments in the neighborhood of the city of Providence, was the occasion of an appropriation by the Board, to be used in procuring analyses of water taken from some of the wells in the immediate vicinity of the Moshassuck and Woonasquatucket rivers. An account of some of this work will be given in another place.

The following circular from the National Board of Health in relation to adulteration of food was considered, and the Secretary was

requested to correspond with Capt. Smart, of the U. S. Army, the supervising chemist of the National Board, and to take such steps in regard to the furnishing of samples for analysis as the circumstances seemed to warrant:

NATIONAL BOARD OF HEALTH,  
WASHINGTON, D. C., June 1, 1880. }

*To C. H. Fisher, M. D., Secretary State Board, Rhode Island:*

DEAR SIR,—The Executive Committee of the National Board of Health having directed Asst. Surgeon Smart, U. S. Army, to investigate and report concerning the prevalence of food adulteration in this country, any assistance which you may render him will be duly appreciated.

Very respectfully your obedient servant,

T. J. TURNER,

*Secretary National Board of Health.*

This matter will be considered at greater length in another part of this report.

The officers elected at this meeting for the year ending on the first Wednesday in July, 1881, were as follows:

Chairman, DAVID KING, M. D. . . . . Newport.

Secretary, CHARLES H. FISHER, M. D. . . . North Scituate.

Auditor, OLIVER C. WIGGIN, M. D. . . . . Providence.

At the quarterly meeting held Oct. 6 the usual reports of the Secretary in regard to work in the various departments of labor were made, and also of the correspondence in relation to the various adulterations of food and the proposed analyses of samples of articles, composing or entering into the composition of food, under the auspices of the National Board of Health.

The report of Assistant Prof. E. E. Calder, of Brown University, of analyses of samples of water taken from wells in the immediate vicinity of the Moshassuck river, in accordance with a resolution passed by the Board at the meeting on July 7, was presented and placed on file. This report will be found on a subsequent page.

An extended account was also given of the occurrence of intermittent fever in Barrington, and of the circumstances connected therewith. This matter will be more fully presented in another part of this report.

The Secretary also called attention to the necessity of changes in, or additions to, the regulations adopted by the Board in relation to glanders in horses, in order to meet various exigencies which experience had shown to be likely at any time to occur.

After a deliberate consideration of proposed amendments, the following were adopted as the complete regulations of the Board, in relation to glanders and other contagious and infectious diseases among cattle and other domestic animals:

REGULATION I. No person having the care or ownership of any horse or other animal having the disease called glanders or farcy, or *suspected* of having such disease, (and so stated by any agent of the State Board of Health, or any person practicing veterinary surgery, or engaged in the treatment of diseased animals,) or any person in possession of any animal suspected of having any other disease highly contagious and dangerous to life, *shall sell or offer* for sale, or permit any such animal to go into or be in any public lane or highway, or expose or keep any such animal within the same building, or within fifty feet of any other animal not so infected, except by permission of some agent of said Board of Health.

REG. II. Any person practicing veterinary surgery, or treating diseased horses and other domestic animals, having *suspicion* that any animal treated or seen by him, has the disease called glanders or farcy, and all other persons having any knowledge or suspicion of any disease or any facts as set forth in the preceding section, shall report the same to some member of the State Board of Health immediately.

REG. III. No horse declared by competent authority to be affected with glanders or farcy shall hereafter be allowed to be kept for experiment, except by permission of some member of the State Board of Health; and all persons shall allow any member of the said Board, or any of its officers or agents, free access to, and full permission to examine any animal *suspected* of having the disease called glanders or farcy.

REG. IV. All persons having the care or ownership of any horse or other animal suspected by any member of the State Board of Health, or its authorized agents, of having the disease called glanders, or any contagious or infectious disease dangerous to life, shall surrender possession of, or *securely keep*, said horse or other animal, in compliance with the orders of either of the members or agents aforesaid, emanating from the office of the said State Board of Health, until the nature of the disease in question has been determined by a veterinary expert.

REG. V. A fee or reward of one dollar will be paid to any person giving notice to the Secretary, or any member of the Board or its agents, of a case of glanders not previously reported.

A special meeting was held Oct. 23 to hear the report of the Secretary in regard to the occurrence of a contagious or infectious parasitic

disease of a fatal character, which had appeared in a herd of cattle in the town of Cumberland.

A history of the disease, and circumstances attending, will be given in another place.

The action of the Secretary was approved, and it was deemed expedient to appoint cattle appraisers for the Board, who might be called upon when occasion required.

The following gentlemen were then appointed appraisers of the Board, to act in any case upon call of the Secretary, where there seemed to be need of the destruction of any animal or animals affected with a contagious disease dangerous to life, or animals liable to convey the disease to other animals not so infected:

OBADIAH BROWN.....Providence.

JABEZ W. MOWRY.....Smithfield.

ARLON MOWRY.....North Smithfield.

The Secretary was empowered by vote to fill vacancies or appoint substitutes.

A special meeting was also held Dec. 15, at which a review of the work of the Secretary for the closing year was given, and various accounts and bills of expenses incurred were examined, audited and ordered paid.

#### BY-LAWS.

No very important change has been made in the By-Laws during the year, and they now stand as follows:

SECTION 1. This body shall be known as the Rhode Island State Board of Health.

SEC. 2. The officers of the Board shall consist of a Chairman, Secretary and Auditor, to be chosen annually at the meeting in July.

SEC. 3. The duties of the Chairman shall be, to preside at the meetings of the Board, to put all votes, to decide questions of order, and to appoint all committees when not otherwise voted by the Board. He shall certify all audited bills to the Governor for payment.

SEC. 4. The Secretary shall perform all duties prescribed in the act establishing this Board, shall keep a record of the proceedings, shall do all acts usually incident to the office, and shall notify the members of all regular meetings, and by the advice of the Chairman, shall call all special meetings.

The Secretary shall have an office in the city of Providence, which he shall



keep open between the hours of eleven A. M. and one o'clock P. M., upon all business days.

SEC. 5. The Auditor shall examine all bills and vouchers, and if correct shall certify the same to the Chairman of the Board.

SEC. 6. A majority of members shall constitute a quorum to transact business, but any member may adjourn.

SEC. 7. The regular meetings of this Board shall be holden at its office in the city of Providence, on the first Wednesday of July, October, January and April, respectively, at such hour as the Board may by vote determine from time to time.

In the following pages, from 9 to 148 inclusive, will be found the Report on the registration of births, marriages and deaths in Rhode Island in 1879, as presented the General Assembly in compliance with law; and also a variety of tables showing the different relations of the same events, by comparison during the same years, and during different years, in periods of years of various lengths from 1852 to 1880.

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# Births, Marriages and Deaths,

IN THE

STATE OF RHODE ISLAND,

FOR THE

*YEAR ENDING DECEMBER 31, 1879.*

ALSO

COMPARISONS OF THE SAME EVENTS FOR VARIOUS PERIODS

FROM 1852 TO 1880.

PREPARED BY

CHARLES H. FISHER, M. D.

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# T A B L E I .

## GENERAL ABSTRACT OF BIRTHS, MARRIAGES AND DEATHS.

### IN THE STATE OF RHODE ISLAND DURING THE YEAR

# 1 8 7 9 .

TOWNS AND DIVISIONS OF THE STATE.	BIRTHS, 1879.										MARRIAGES, 1879.										DEATHS, 1879.												
	SEX.					PARENTAGE.					Whole Number.	NATIVITY.					Whole Number.	SEX.					PARENTAGE.					Ages Given.		Average Age in years.		Aggregate Age, in years, of all.	Average Age, in years, of all.
	Males.		Females.		American.	Foreign.	Am. father.	For. father.	Am. mother.	For. mother.		American.	Foreign.	Am. male.	For. male.	Am. female.		Males.	Females.	American.	Foreign.	Males.	Females.	Males.	Females.	Males.	Females.						
	Whole Number.																																
Barrington.....	1,359	19	10	9	18	1	1	1	1	1	11	11	1	3	0	12	8	4	11	1	3	0	167	361	55.67	40.11	598	44.00					
Bristol.....	6,028	133	72	63	58	54	13	10	3	40	28	8	87	45	1,306	32	37	45	57	25	45	1,306	2,103	37.70	49.04	8,557	43.38						
Warren.....	4,008	86	51	35	45	2	6	6	4	43	16	5	26	20	80	56	26	30	34	32	30	806	1,049	38.34	34.97	2,006	36.45						
Bristol County...	11,395	240	133	107	121	88	15	16	7	94	57	24	6	7	150	66	84	92	56	65	84	2,518	3,572	38.74	42.52	6,090	40.87						
Coventry.....	4,530	75	39	36	47	24	1	3	2	28	25	1	2	0	64	37	27	37	1780	1,048	48.11	38.81	2,828	1,780	40.48	38.81	2,828	44.18					
East Greenwich.....	2,897	56	23	33	30	16	6	4	3	36	25	6	3	2	42	20	22	22	16	20	22	828	1,000	41.40	45.45	1,828	43.52						
West Greenwich.....	1,018	24	10	14	21	8	1	8	1	6	5	1	1	0	22	8	14	4	22	8	14	4	768	5.50	54.71	810	36.82						
Warwick.....	12,167	277	139	138	105	134	20	15	8	101	47	32	14	8	183	89	94	100	88	89	94	2,066	2,770	30.32	39.46	5,465	32.86						
Kent County.....	20,592	432	211	221	203	174	27	23	3	171	102	39	30	10	311	154	157	209	102	154	157	5,347	5,564	34.72	35.57	10,931	35.15						
Janetown.....	459	6	4	2	6	1	1	1	1	4	4	1	2	1	2	1	1	1	1	1	1	47	1	47.00	1.00	48	84.00						
Little Compton.....	1,201	13	8	5	9	3	1	1	1	3	3	1	12	6	12	6	6	6	12	1	6	6	825	341	54.17	56.83	666	55.50					
Middletown.....	1,139	26	12	14	25	1	1	1	1	2	2	1	15	9	15	9	6	14	1	9	6	44	949	46.00	38.17	703	34.87						
New Shoreham.....	1,214	17	7	10	17	1	1	1	1	4	4	1	6	2	6	2	4	4	1	2	4	87	180	43.00	40.00	367	34.50						
Portsmouth.....	1,979	30	16	14	19	9	1	1	1	9	4	1	22	14	22	14	8	18	4	14	8	460	364	33.00	45.30	364	34.82						
Tiverton.....	2,505	46	27	21	31	12	3	2	1	25	19	1	2	3	36	24	14	31	7	23	14	851	756	36.13	34.00	1,567	42.89						
TOWNS, NEWPORT Co.	8,497	140	74	66	107	24	5	4	1	47	40	1	2	4	95	56	39	82	13	55	39	2,194	1,991	39.89	51.06	4,185	44.52						
NEWPORT CITY.....	15,698	303	151	152	144	91	37	37	0	122	71	27	0	15	264	117	147	160	104	117	146	3,734	5,463	32.34	37.41	9,946	35.15						

## DEATHS, 1879.

Population, 1880.	SEX.		PARENTAGE.				NATIVITY.				Whole Number.	SEX.		PARENTAGE.		AGES GIVEN.		Aggregate Age in yrs.		Average Age in years.			
	Whole Number.	Males.	Females.	American.	Foreign.	Am. male.	For. male.	Am. female.	For. female.	Males.		Females.	American.	Foreign.	Males.	Females.	Males.	Females.	Males.	Females.	Average Age, in years, of all.	Aggregate Age, in years, of all.	
5,716	138	76	62	46	68	6	20	8	7	76	40	36	42	34	40	36	1,413	1,650	35.32	45.83	3,083	40.36	
5,941	113	63	50	56	35	14	8	1	1	121	62	59	61	60	62	59	2,670	2,407	43.06	40.79	5,077	41.56	
6,445	154	88	66	43	92	9	10	45	6	81	45	38	20	52	45	36	1,283	1,275	38.51	35.42	2,558	31.56	
5,656	168	86	82	83	64	9	12	27	21	93	43	48	60	33	44	48	1,206	1,798	37.48	36.00	2,997	31.92	
1,552	47	25	15	10	25	1	1	1	1	33	17	16	20	23	13	10	826	717	63.54	71.70	1,543	67.09	
2,250	25	15	10	25	16	1	1	1	1	33	17	16	20	23	13	10	826	717	63.54	71.70	1,543	67.09	
5,765	129	55	74	79	34	7	9	22	20	100	91	90	50	140	90	97	2,104	2,335	23.88	34.07	4,439	23.74	
13,897	383	186	197	86	248	14	35	3	7	132	8	9	5	7	8	9	139	281	43.01	31.22	10,717	34.17	
1,467	41	20	21	18	14	6	3	2	2	17	17	22	17	22	17	22	641	547	39.14	32.18	1,008	30.57	
3,088	85	35	50	24	50	3	8	29	14	319	142	174	151	168	142	174	4,469	5,191	41.37	39.83	9,660	30.57	
19,061	483	253	230	174	197	47	65	172	102	30	27	13	33	37	21	25	944	1,205	44.95	48.20	2,149	46.72	
3,810	71	29	42	56	10	3	2	46	41	1	1	2	2	7	11	13	392	661	35.25	50.84	1,053	43.87	
3,085	61	31	30	28	23	4	6	11	9	1	1	1	1	7	11	13	392	661	35.25	50.84	1,053	43.87	
16,035	370	202	168	76	249	20	25	160	71	274	132	142	54	220	131	142	2,995	3,872	22.80	27.27	6,867	25.15	
93,138	2,268	1,164	1,104	823	1,098	143	204	697	420	1,377	664	713	598	779	661	708	21,023	23,363	31.82	33.04	44,426	32.45	
104,862	2,522	1,297	1,225	1,029	1,095	199	259	1,071	653	2,026	1,004	1,022	941	1,085	1,004	1,022	28,198	30,194	28.09	29.54	58,392	28.82	
1,117	15	10	5	13	2	.....	.....	.....	7	17	10	7	16	1	10	7	719	424	71.90	60.57	1,143	67.23	
1,310	31	17	14	31	.....	.....	.....	.....	13	16	6	10	16	.....	10	10	295	521	44.17	52.10	1,786	40.12	
2,954	55	25	30	49	4	.....	.....	.....	1	26	14	12	25	1	14	11	719	599	51.36	54.45	1,318	52.72	
3,949	96	44	52	68	18	8	2	41	39	1	46	21	25	38	8	21	871	1,271	41.48	50.84	2,142	46.56	
5,135	100	55	45	86	3	5	6	39	34	1	59	26	33	54	5	32	970	1,530	38.80	47.50	2,490	43.68	
1,949	48	27	21	37	3	1	1	21	14	7	21	14	7	17	4	14	7	550	920	39.29	31.43	1,770	36.67
6,104	100	51	49	56	29	6	9	60	42	64	31	33	46	18	30	33	930	1,063	32.07	31.26	1,993	31.63	
22,508	445	229	216	340	63	22	20	194	168	249	122	127	212	37	120	125	5,024	5,618	41.87	44.94	10,642	43.44	
11,395	240	133	107	121	88	15	16	94	57	150	66	84	92	58	65	84	2,518	3,572	38.74	42.52	6,090	40.87	
20,392	432	211	221	203	174	27	28	171	102	30	20	10	31	102	154	157	5,347	5,984	34.72	35.57	10,931	35.15	
24,195	443	225	218	251	115	36	41	169	111	359	178	186	242	117	172	185	5,978	7,453	39.40	40.28	13,431	37.62	
198,020	4,700	2,401	2,299	1,852	2,133	342	463	1,768	1,073	3,403	1,068	1,735	1,539	1,864	1,065	1,230	49,221	53,387	31.57	30.97	102,818	30.28	
22,508	445	229	216	340	63	22	20	194	168	249	122	127	212	37	120	125	5,024	5,618	41.87	44.94	10,642	43.44	
276,710	6,350	3,259	3,091	2,767	2,573	442	568	2,396	1,511	4,472	2,183	2,289	2,294	2,178	2,176	2,281	98,098	72,814	31.20	33.24	143,012	32.29	

TABLE II.—BIRTHS, 1879.

*Arranged for Months, Sexes and Divisions of the State.*

MONTHS.	SEX.	DIVISIONS OF THE STATE.							
		Whole State.	Bristol County.	Kent County.	Newport County, Towns.	Newport City.	Providence County, Towns.	Providence City.	Washington County.
January....	Males....	284	14	8	4	12	115	117	14
	Females..	236	9	10	8	13	105	80	11
	Total....	520	23	18	12	25	220	197	25
February...	Males....	230	6	15	4	15	79	95	16
	Females..	237	11	9	2	10	78	107	20
	Total....	467	17	24	6	25	157	202	36
March.....	Males....	235	8	12	7	11	84	97	16
	Females..	243	6	22	3	12	88	91	21
	Total....	478	14	34	10	23	172	188	37
April.....	Males....	260	11	23	5	10	78	111	22
	Females..	248	6	19	3	9	92	93	26
	Total....	508	17	42	8	19	170	204	48
May.....	Males....	235	13	15	4	10	83	93	17
	Females..	251	12	16	6	12	75	112	18
	Total....	486	25	31	10	22	158	205	35
June.....	Males....	299	11	18	4	9	117	127	13
	Females..	263	11	18	8	15	79	112	20
	Total....	562	22	36	12	24	196	239	33
July.....	Males....	281	11	15	8	15	103	108	21
	Females..	259	10	21	2	10	96	104	16
	Total....	540	21	36	10	25	199	212	37

TABLE II.—BIRTHS, 1879.—Continued.

MONTHS.	SEX.	Whole State.	DIVISIONS OF THE STATE.						
			Bristol County.	Kent County.	Newport County, Towns.	Newport City.	Providence County, Towns.	Providence City.	Washington County.
August. ....	Males....	279	12	22	14	15	91	100	25
	Females..	299	12	34	6	12	98	115	22
	Total....	578	24	56	20	27	189	215	47
September..	Males....	273	9	19	3	15	92	109	26
	Females..	262	9	17	7	10	85	114	20
	Total....	535	18	36	10	25	177	223	46
October ....	Males....	287	13	13	6	16	99	124	16
	Females..	288	10	18	9	18	97	123	13
	Total....	575	23	31	15	34	196	247	29
November..	Males....	281	11	25	8	10	105	101	21
	Females..	219	4	19	7	19	93	66	11
	Total....	500	15	44	15	29	198	167	32
December ..	Males....	315	14	26	7	13	118	115	22
	Females..	286	7	18	5	12	118	108	18
	Total....	601	21	44	12	25	236	223	40
Whole Year.	Males....	3,259	133	211	74	151	1,164	1,297	229
	Females..	3,091	107	221	66	152	1,104	1,225	216
	Total....	6,350	240	432	140	303	2,268	2,522	445

TABLE III.—PLURALITY BIRTHS, 1879.

ARRANGED BY MONTHS AND DIVISIONS OF THE STATE, AND SHOWING THE NATIVITY OF THE PARENTS.

MONTHS.	Number of Cases.	SEX.	No. of Children.	DIVISIONS OF THE STATE.						NATIVITY OF THE PARENTS.																
				Bristol County.	Kent County.	Newport Co., Town.	Newport City.	Providence Co., Town.	Providence City.	Washington Co.	American.	Irish.	English.	Scotch.	British American.	Swedish.	Portuguese.	American Father.	Irish Mother.	American father.	Br. Am. mother.	English mother.	American mother.	Irish father.	Br. Am. mother.	Scotch father.
January....	9	Males. Females.	10 8	...	...	...	...	7	2	3	4	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...
February....	2	Males. Females.	2 2	...	...	...	...	2	...	1	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
March.....	3	Males. Females.	2 4	...	...	...	3	...	...	1	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...
April.....	4	Males. Females.	4 4	...	...	...	2	1	1	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...
May.....	5	Males. Females.	3 7	2	...	...	...	3	...	3	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...
June.....	5	Males. Females.	8 2	...	...	...	2	2	1	2	1	...	...	1	...	...	...	...	...	...	...	1	...	...	...	...
July.....	6	Males. Females.	7 5	1	1	1	2	...	1	5	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
August.....	9	Males. Females.	10 8	2	...	1	4	1	3	3	2	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...
September...	6	Males. Females.	7 5	...	...	...	...	3	3	2	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...
October.....	3	Males. Females.	4 2	1	1	...	1	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
November...	3	Males. Females.	3 3	...	...	...	1	2	...	2	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
December...	9	Males. Females.	10 8	3	...	1	4	...	4	4	2	...	...	1	...	...	...	...	1	...	...	...	...	...	...	...
Whole Year..	64	Males. Females.	70 56	37	13	20	23	7	31	12	3	2	3	1	2	1	1	1	1	1	2	1	1	1	1	1

TABLE IV.—MARRIAGES, 1879.

*Arranged by Months and Divisions of the State.*

MONTHS.	Whole State, 1879.	DIVISIONS OF THE STATE.							Whole State, 1878.
		Bristol County.	Kent County.	Newport County, Towns.	Newport City.	Providence County, Towns.	Providence City.	Washington County.	
January.....	217	6	20	5	9	59	102	16	197
February.....	183	7	12	3	7	61	85	8	160
March.....	121	2	7	3	5	39	47	18	159
First Quarter.....	521	15	39	11	21	159	234	42	516
April.....	198	6	20	4	11	60	83	14	169
May.....	205	6	18	1	7	61	98	14	192
June.....	208	3	12	3	13	62	96	19	208
Second Quarter.....	611	15	50	8	31	183	277	47	569
July.....	158	12	15	2	8	47	59	15	197
August.....	187	5	12	6	7	54	88	15	152
September.....	209	9	9		11	64	106	10	208
Third Quarter.....	554	26	36	8	26	165	253	40	557
October.....	221	18	12	5	16	52	103	15	236
November.....	292	12	26	8	17	75	128	26	258
December.....	197	8	8	7	11	63	76	24	182
Fourth Quarter.....	710	38	46	20	44	190	307	65	676
Whole Year.....	2,396	94	171	47	122	697	1,071	194	2,318



TABLE V.—AGES OF PERSONS MARRIED, 1879.

AGES OF MEN.	AGES OF WOMEN .											Whole Number of Males.	
	Under 20.	20 to 25.	25 to 30.	30 to 35.	35 to 40.	40 to 45.	45 to 50.	50 to 55.	55 to 60.	60 to 65.	65 to 70.		Not stated.
Under 20.....	66	26	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	94
20 to 25.....	325	495	73	7	3	1	.....	.....	.....	.....	.....	1	905
25 to 30.....	115	312	214	34	13	2	.....	.....	.....	.....	.....	1	691
30 to 35.....	24	85	107	62	22	4	.....	.....	.....	.....	.....	.....	304
35 to 40.....	9	31	47	37	24	4	5	1	.....	.....	.....	.....	158
40 to 45.....	6	11	13	11	22	7	8	3	.....	.....	.....	.....	81
45 to 50.....	....	7	5	12	8	6	4	3	1	.....	.....	.....	46
50 to 55.....	....	4	....	6	8	6	8	5	.....	.....	.....	.....	37
55 to 60.....	....	2	1	4	6	4	2	2	1	1	.....	.....	23
60 to 65.....	....	1	1	2	3	6	2	5	1	.....	.....	.....	21
65 to 70.....	....	....	1	2	3	1	1	3	3	2	1	.....	17
70 to 75.....	..	....	1	.....	.....	1	1	2	3	1	.....	.....	9
75 to 80.....	.....	.....	.....	.....	1	.....	.....	1	.....	.....	.....	.....	2
80 to 85.....	.....	..	.....	.....	.....	.....	1	1	.....	.....	.....	.....	2
85 to 90.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	1
Not stated.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	4	.....	5
Whole No. Females.	545	974	465	177	114	42	32	19	16	5	1	6	2,396

TABLE VI.—DEATHS, 1879.

*Arranged by Months, Sexes, and Divisions of the State.*

MONTHS.	SEX.	Whole State.	DIVISIONS OF THE STATE.						
			Bristol County.	Kent County.	Newport County, Towns.	Newport City.	Providence County, Towns.	Providence City.	Washington County.
January ...	Males...	230	7	20	5	15	62	111	10
	Females..	238	12	11	4	13	90	89	19
	Total....	468	19	31	9	28	152	200	29
February...	Males...	160	2	7	5	10	51	77	8
	Females..	175	6	16	3	6	57	74	13
	Total....	335	8	23	8	16	108	151	21
March ...	Males....	189	5	6	5	14	71	80	8
	Females..	193	2	13	1	11	71	83	12
	Total....	382	7	19	6	25	142	163	20
April.....	Males....	162	6	11	5	8	45	80	7
	Females..	180	6	17	3	9	50	87	8
	Total....	342	12	28	8	17	95	167	15
May.....	Males....	159	5	10	3	8	55	68	10
	Females..	159	2	11	2	15	36	84	9
	Total....	318	7	21	5	23	91	152	19
June.....	Males....	134	3	14	6	10	32	53	16
	Females..	145	4	11	2	12	42	67	7
	Total....	279	7	25	8	22	74	120	23
July.....	Males....	186	10	10	1	10	55	89	11
	Females..	197	7	15	3	12	50	98	12
	Total....	383	17	25	4	22	105	187	23
August....	Males....	233	9	14	7	14	84	92	13
	Females..	219	14	16	8	22	65	80	14
	Total....	452	23	30	15	36	149	172	27
September..	Males....	157	6	14	5	8	56	63	5
	Females..	182	15	12	4	15	56	71	9
	Total....	339	21	26	9	23	112	134	14
October ...	Males....	182	6	15	8	8	52	84	9
	Females..	209	6	11	4	18	81	83	6
	Total....	391	12	26	12	26	133	167	15
November ..	Males....	197	3	18	2	6	51	98	19
	Females..	191	4	12	3	8	54	102	8
	Total....	388	7	30	5	14	105	200	27
December...	Males....	194	4	15	4	6	50	109	6
	Females..	201	6	12	2	6	61	104	10
	Total....	395	10	27	6	12	111	213	16
Whole Year.	Males....	2,183	66	154	56	117	664	1,004	122
	Females..	2,289	84	157	39	147	713	1,022	127
	Total....	4,472	150	311	95	264	1,377	2,026	249

TABLE VII.—DEATHS, 1879.

*Showing the Number of each Sex, in each Period of Life, in every Town and Division of the State; also the Ratio of Deaths to Population.*

TOWNS AND DIVISIONS OF THE STATE.	POPULATION, 1880.		DEATHS, 1879.					
	Whole Number.	SEX.	Per cent. to Population.	Whole Number.	SEX.	Under 1 year.	1 and under 2.	2 and under 3.
Barrington.....	1,359	Males...	.88	12	3	1	...	...
		Females.			9	...	...	1
Bristol.....	6,028	Males...	1.36	82	37	7	1	1
		Females.			45	3	3	2
Warren.....	4,008	Males...	1.39	56	26	4	...	...
		Females.			30	7	2	1
BRISTOL COUNTY....	11,395	Males...	1.32	150	66	12	1	1
		Females.			84	10	5	4
Coventry.....	4,520	Males...	1.42	64	37	4	1	1
		Females.			27	5	1	..
East Greenwich .....	2,887	Males...	1.45	42	20	2	1	..
		Females.			22	2	1	1
West Greenwich ....	1,018	Males...	2.16	22	8	2	..	1
		Females.			14	..	..	..
Warwick.....	12,167	Males...	1.50	163	89	20	8	7
		Females.			94	19	7	3
KENT COUNTY.....	20,592	Males...	1.51	311	154	28	10	9
		Females.			157	26	9	4
Jamestown.....	459	Males...	.44	2	1	..	..	..
		Females.			1	1	..	..
Little Compton.....	1,201	Males...	1.00	12	6	..	..	..
		Females.			6	..	1	..
Middletown.....	1,139	Males...	1.32	15	9	1	1	..
		Females.			6	1	..	..
New Shoreham.....	1,214	Males...	.49	6	2	..	..	..
		Females.			4	1	..	..
Portsmouth.....	1,979	Males...	1.11	22	14	5	..	..
		Females.			8	1	1	..
Tiverton.....	2,505	Males...	1.52	38	24	5	3	..
		Females.			14	1	..	..
TOWNS, NEWPORT Co.	8,497	Males...	1.12	95	56	11	4	..
		Females.			39	5	2	..
NEWPORT CITY.....	15,698	Males...	1.68	264	117	25	7	3
		Females.			147	27	7	5

TABLE VII.—DEATHS, 1879.—Continued.

3 and under 4.	4 and under 5.	5 and under 10.	10 and under 15.	15 and under 20.	20 and under 30.	30 and under 40.	40 and under 50.	50 and under 60.	60 and under 70.	70 and under 80.	80 and under 90.	90 and over.	Not stated.
...	...	1	1	...	2	...	...	1	...	2	2	...	...
1	1	...	2	...	1	4	3	5	5	4	2	...	...
...	1	...	1	1	2	3	5	5	5	6	5	1	...
...	1	...	3	1	2	1	5	...	5	1	1	1	1
1	1	...	...	1	2	1	3	1	4	3	2	1	...
1	2	...	5	1	3	5	8	5	10	5	5	1	1
1	2	1	2	2	6	4	8	7	9	13	8	2	...
...	...	2	...	2	2	2	2	2	5	10	3	1	...
...	...	1	3	...	3	1	1	2	5	2	2	1	...
...	2	1	...	...	3	...	1	1	2	7	...	...	...
1	...	2	...	1	...	1	1	2	2	4	3	1	...
...	2	1	2	...	...	...	...	...	...	...	...	...	...
...	...	1	1	...	...	2	2	...	3	3	1	1	...
2	3	4	...	3	5	3	5	4	8	9	8	...	...
3	3	4	3	4	9	9	3	5	9	8	2	3	...
2	7	8	2	5	10	5	8	7	15	26	11	1	...
4	3	8	7	5	12	13	7	9	19	17	8	6	...
...	...	...	...	...	...	...	1	...	...	...	...	...	...
...	...	1	...	...	1	1	...	...	...	...	3	...	...
...	...	...	...	...	...	1	...	...	1	1	1	1	...
1	...	...	...	...	...	...	...	...	5	...	...	1	...
...	...	...	...	...	...	1	...	...	...	3	1	...	...
...	...	...	...	...	...	1	...	1	...	...	...	...	...
...	...	...	...	...	...	...	...	1	2	...	...	...	...
...	1	...	...	...	1	...	1	2	1	2	...	1	...
...	...	...	...	...	1	...	1	...	1	2	1	...	...
...	1	2	...	...	2	...	1	...	2	3	4	...	1
...	...	...	...	1	1	1	1	3	3	1	...	2	...
1	2	3	...	...	4	2	3	3	8	5	7	2	1
...	...	...	...	1	2	3	2	4	7	7	3	3	...
4	2	8	2	2	6	9	7	11	16	10	5	...	...
4	2	11	4	2	7	8	9	9	13	20	16	2	1

TABLE VII.—DEATHS, 1879.—Continued.

TOWNS AND DIVISIONS OF THE STATE.	POPULATION, 1880.		DEATHS, 1879.					
	Whole Number.	SEX.	Per cent to Population.	Whole Number.	SEX.	Under 1 year.	1 and under 2.	3 and under 3.
Burrillville.....	5,716	Males...	1.33	76	40	9	2	1
		Females.			36	3		
Cranston.....	5,941	Males...	2.04	121	62	6		
		Females.			59	4	4	1
Cumberland.....	6,445	Males...	1.26	81	45	10	4	
		Females.			36	7	2	2
East Providence..	5,056	Males...	1.84	93	45	13	3	3
		Females.			48	7	1	1
Foster.....	1,552	Males...	1.48	23	13			
		Females.			10			
Glocester.....	2,250	Males...	1.47	33	17	2		
		Females.			16	3	2	1
Johnston.....	5,765	Males...	.80	46	20	1	4	
		Females.			26	2	4	1
Lincoln.....	13,867	Males...	1.37	190	91	21	14	5
		Females.			99	23	4	8
North Providence.	1,467	Males...	.82	12	3	1		
		Females.			9	4		
North Smithfield.	3,088	Males...	1.26	39	22	5	3	
		Females.			17	3	2	1
Pawtucket.....	19,061	Males...	1.67	319	142	19	9	3
		Females.			177	19	17	7
Scituate.....	3,810	Males...	1.21	46	21	1	1	1
		Females.			25	2	1	
Smithfield.....	3,085	Males...	.78	24	11	2		1
		Females.			13		1	1
Woonsocket. ....	16,055	Males...	1.71	274	132	43	12	4
		Females.			142	32	14	9
TOWNS, PROV. CO.	93,158	Males...	1.48	1,377	664	133	52	18
		Females.			713	109	52	32
PROVIDENCE CITY	104,862	Males...	1.93	2,026	1,004	168	76	48
		Females.			1,022	148	69	51
Charlestown.....	1,117	Males...	1.52	17	10			
		Females.			7			
Exeter.....	1,310	Males...	1.22	16	6	1		
		Females.			10	1		
Hopkinton.....	2,954	Males...	.88	26	14	1	1	
		Females.			12		1	
North Kingstown.	3,949	Males...	1.16	46	21	1	1	
		Females.			25	2	1	
South Kingstown.	5,125	Males...	1.15	59	26		3	1
		Females.			33	2		
Richmond.....	1,949	Males...	1.08	21	14	3		2
		Females.			7	2		
Westerly.....	6,104	Males...	1.05	64	31	6	1	1
		Females.			33	9	2	
WASHINGTON CO.	22,508	Males...	1.11	249	122	12	6	4
		Females.			127	16	4	

TABLE VII.—DEATHS, 1879.—Continued.

3 and under 4.	4 and under 5.	5 and under 10.	10 and under 15.	15 and under 20.	20 and under 30.	30 and under 40.	40 and under 50.	50 and under 60.	60 and under 70.	70 and under 80.	80 and under 90.	90 and over.	Not stated.
2	...	1	1	...	6	2	3	2	3	2	6	...	...
1	2	1	...	3	5	...	2	4	3	7	4	1	...
3	...	3	...	1	4	9	6	10	10	8	2	...	...
...	2	3	...	4	3	10	6	2	6	8	5	1	...
2	...	1	1	1	8	4	2	3	6	1	1	1	...
1	...	...	...	1	4	3	2	4	5	1	4	...	...
...	1	2	1	...	2	4	2	4	3	5	1	...	1
...	2	2	2	3	4	4	2	5	10	5	...	...	...
...	...	...	...	...	2	...	1	1	4	...	4	1	...
...	...	...	...	...	...	...	...	3	2	3	...	2	...
...	...	...	1	...	...	1	...	2	2	1	5	3	...
...	...	...	...	...	...	1	1	1	3	1	2	1	...
...	...	2	...	...	...	1	1	1	4	2	3	1	...
1	...	1	1	2	1	3	2	2	1	3	2	...	...
...	3	1	1	4	12	6	6	3	7	4	2	1	1
5	1	8	...	4	11	5	7	5	7	7	...	2	2
...	...	...	...	...	...	...	1	...	...	...	1	...	...
...	...	...	...	...	1	...	2	...	...	1	1	...	...
...	2	...	1	...	3	...	1	1	2	2	2	...	...
...	...	1	...	...	2	2	2	...	...	2	1	1	...
12	5	11	2	2	15	9	8	12	18	12	4	1	...
10	5	9	4	8	26	12	11	8	11	15	10	2	3
...	...	1	...	...	3	...	3	4	4	2	1	...	...
...	...	...	...	2	2	1	2	2	9	2	1	1	...
...	...	1	1	...	...	1	1	...	2	1	1	...	...
...	...	...	...	2	...	2	...	...	1	2	4	...	...
6	3	6	3	2	9	4	6	10	11	9	2	1	1
1	3	4	2	10	10	12	8	6	15	9	6	1	...
25	14	29	12	10	64	41	41	53	76	49	35	9	3
19	15	29	9	39	69	55	47	42	73	66	40	12	5
52	37	81	20	20	80	81	56	81	90	75	36	3	...
34	31	94	23	28	113	83	67	71	82	74	47	7	...
...	...	...	...	...	...	1	...	2	1	2	3	1	...
...	...	...	...	1	...	...	1	1	1	2	...	1	...
...	...	...	...	...	1	...	2	...	...	2	...	...	...
...	...	...	...	1	1	1	1	...	1	1	3	...	...
...	...	...	...	...	...	3	2	...	3	2	2	...	...
...	...	...	...	...	...	2	1	2	2	...	3	...	1
1	...	3	1	...	...	3	1	2	4	3	1	...	...
1	...	1	...	1	2	...	3	1	1	8	4	...	...
...	1	3	2	...	1	...	3	1	5	4	1	...	1
1	...	1	...	2	3	4	4	3	4	1	4	3	1
...	1	1	...	...	...	...	...	1	...	3	3	...	...
...	1	1	...	...	1	...	...	...	...	...	1	1	...
1	...	1	...	1	2	2	8	2	4	1	...	...	1
...	1	...	2	2	2	4	2	1	1	4	1	2	...
2	2	8	3	1	4	9	16	8	17	17	10	1	2
2	2	3	2	7	8	12	12	8	10	16	16	...	2

TABLE VII.—DEATHS, 1879.—RECAPITULATION BY COUNTIES.

COUNTIES.	POPULATION, 1880.		DEATHS, 1879.			Under 1 year.	1 and under 2.	2 and under 3.
	Whole Number.	SEX.	Per cent. to Population.	Whole Number.	SEX.			
BRISTOL Co. . .	11,395	Males. .	1.32	150	66	12	1	1
		Females			84	10	5	4
KENT Co. . . .	20,592	Males. .	1.51	311	154	28	10	9
		Females			157	26	9	4
NEWPORT Co.	24,195	Males. .	1.48	359	173	36	11	3
		Females			186	32	9	5
PROV. Co. . . .	198,020	Males. .	1.72	3,403	1,668	301	128	66
		Females			1,735	257	121	83
WASH. Co. . . .	22,508	Males. .	1.11	249	122	12	6	4
		Females			127	16	4	..
WHOLE STATE.	276,710	Males. .	1.62	4,472	2,183	389	156	83
		Females			2,289	341	148	96

\* The number of the sexes, respectively, by the Census of 1880, was not ascertained when this Table went to press.

TABLE VII.—DEATHS, 1879.—RECAPITULATION BY COUNTIES.

3 and under 4.	4 and under 5.	5 and under 10.	10 and under 15.	15 and under 20.	20 and under 30.	30 and under 40.	40 and under 50.	50 and under 60.	60 and under 70.	70 and under 80.	80 and under 90.	90 and over.	Not stated.
1	2	....	5	1	3	5	8	5	10	5	5	1	1
1	2	1	2	2	6	4	8	7	9	13	8	2	....
2	7	8	2	5	10	5	8	7	15	26	11	1	....
4	3	8	7	5	12	13	7	9	19	17	8	6	....
5	4	11	2	2	10	11	10	14	24	15	12	2	1
4	2	11	4	3	9	11	11	13	20	27	19	5	1
77	51	110	32	30	144	122	97	134	166	124	71	12	3
53	46	123	32	67	182	138	114	113	155	140	87	19	5
2	2	8	3	1	4	9	16	8	17	17	10	1	2
2	2	3	2	7	8	12	12	8	10	16	16	7	2
87	66	137	44	39	171	152	139	163	232	187	109	17	7
64	55	146	47	84	217	178	152	150	213	213	138	39	8



TABLE VIII.—CAUSES OF DEATH, 1879.

Arranged Alphabetically; showing the Number of each Sex, who died from each cause, in each Month and in the whole year 1879; also the Number of American and of Foreign Parentage, from each cause, for the year.

CAUSES OF DEATH.	PARENTAGE.		Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	SEX.		
	Am.	For. Total.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
Accidents (various) .....	14	22	36												25	11	36
“ Burns and Scalds. ....	7	6	13	1				1	1					2	4	9	13
“ Drowning. ....	9	13	22			3	2	1	4	3	2	1			21	1	22
“ Falls.....	9	7	16	2					2		1	1	2	1	11	5	16
“ Poisoning .....	3	2	5	1	2		1								3	2	5
“ Railroad.....	2	8	10	1	1			1	1			1	2	2	10		10
Abscesses .....	10	4	14	1	1		1	1	1	1	1	2	2	1	5	9	14
Aorta, Disease of .....	1	1													1		1
Anæmia.....	5	2	7	2	1		1	1	1	1		1			2	5	7
Aneurism.....		1	1								1				1		1
Apoplexy.....	84	53	137	9	4	1	9	4	9	8	10	7	6	5	6	8	137
Asthma .....	1	12	13	1	1	1		2	1	1	1	1	1		5	8	13
Bladder, Disease of .....	5	7	12		3		1		1		1	2	1		11	1	12
“ Gravel and Calculus. ....	1	1	2	1										1		1	1
Bones, Disease of .....	1	1	2			1									1	1	2
Bowels, Disease of .....	1	1	2											1	1	1	2
Brain, Disease of .....	37	15	52	2	3	4	2	4	2	4	1	2	1	1	3	2	52
“ Congestion of .....	12	14	26		3	1	2	3	1		1		2	1	2	3	26
“ Inflammation of .....	33	46	79	5	4	3	2	4	7	3	6	2	3	3	4	4	79
Bronchitis.....	31	31	62	4	9	5	4	8	4	4	2	2	2	1	5	3	62
Cancer (various).....	41	29	70	3	4	1	1	3	5	2	2	5	2	3	4	4	70

## CAUSES OF DEATH.

CAUSES OF DEATH.	PARENTAGE.												SEX.											
	Am.	For.	Total.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	M.	F.	Total.						
Cancer of Breast.....	4	6	10	1	1	2		2		2			1			1	10	10						
“ of Stomach.....	13	11	24	1	1	1	1	1	2	1	3	2	1	1	1	1	12	12						
“ of Uterus.....	12	9	21		3	1		1	3		4	2	3	3	1	1	21	21						
Cancerum Oris.....	1		1		1					1							1	1						
Carbuncle.....	1		1																					
Catarrh.....	2	3	5			1			1	1	1	1	1				2	3						
Cellulitis, Pelvic.....	1	1						1									1	1						
Chicken Pox.....		1	1					1																
Child-birth.....	12	14	26	3	2	1	3		1	3	1	2	1	2	7		26	26						
“ Puerperal Convulsions.....	4	4	8		1	1				1	1			2	2		8	8						
“ Puerperal Fever.....	5	4	9		2	1	1			1		1	1	1	1		9	9						
Cholera Infantum.....	71	90	161		1	1	1	1	1	2	2	3	3	7	7	2	88	73						
“ Morbus.....	1	7	8							1	2	3	2				3	5						
Colic.....	7	2	9	1	1			2	2	1		1	1				6	3						
Consumption.....	278	359	637	36	34	27	28	37	31	24	25	22	25	16	20	16	30	23						
Convulsions.....	37	62	99	5	6	7	2	1	4	5	2	6	1	4	1	5	6	8						
Croup.....	40	56	96	8	7	6	7	11	4	4	3	2	3	3	4	1	1	3						
Debility.....	34	49	83	2	5	3	2	6	3	3	2	4	2	1	4	7	5	1						
“ Birth Premature.....	7	9	16			2	2		1		1			1	2		4	2						
Diabetes.....	11	4	15	1	1		1		1	1	1	1	1	1	1		8	7						
Diarrhoea.....	17	28	45	1	1				1	2	2	5	8	7	6	6	1	2						
“ Chronic.....	5	3	8			2		2	1								1	1						
Diphtheria.....	143	116	259	9	11	5	12	9	11	13	3	7	7	6	17	7	5	10						
Dropsy.....	35	15	50	1	2	2	2	3	4	1	3	1	3	4	2	3	5	2						
“ of Chest.....	4		4								1		1	1			1	1						
Dysentery.....	23	18	41								3	1		1	2	5	4	7						
“ Typhoid.....	2	1	3	1								1	1				2	1						

TABLE VIII.—CAUSES OF DEATH, 1879.

Arranged Alphabetically; showing the Number of each Sex, who died from each cause, in each Month and in the whole year 1879; also the Number of American and of Foreign Parentage, from each cause, for the year.

CAUSES OF DEATH.	PARENTAGE.		Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	SEX.			
	Am.	For.	Total.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	Total.
Accidents (various) .....	14	22	36	3	3	4	2	1	1	3	1	2	1	2	2	25	11	36
“ Burns and Scalds. ....	7	6	13	1	1	1	1	1	1	1	1	1	3	2	1	4	9	13
“ Drowning. ....	9	13	22	2	2	2	3	2	1	2	3	4	3	2	1	21	1	22
“ Falls.....	9	7	16	2	2	1	1	1	2	2	1	1	2	2	1	11	5	16
“ Poisoning.....	3	2	5	1	1	2	1	1	1	1	1	1	1	1	1	3	2	5
“ Railroad.....	2	8	10	1	1	1	1	1	1	1	1	1	1	2	2	10	1	10
Abcesses .....	10	4	14	1	1	1	1	1	1	1	1	1	2	2	1	5	9	14
Aorta, Disease of .....	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
Anæmia.....	5	2	7	2	1	1	1	1	1	1	1	1	1	1	1	2	5	7
Aneurism.....	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
Apoplexy.....	84	53	137	9	4	1	9	4	9	8	10	7	6	5	4	6	9	137
Asthma.....	1	12	13	1	1	1	1	1	1	1	1	1	1	1	1	5	8	13
“adder, Disease of .....	5	7	12	1	3	1	1	1	1	2	1	2	1	2	1	11	1	12
“ Gravel and Calculus. ....	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
“ones, Disease of .....	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
“wels, Disease of .....	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
“rain, Disease of .....	37	15	52	2	3	4	2	4	2	4	1	2	1	2	2	29	23	52
“ Congestion of .....	12	14	26	3	1	2	3	1	1	3	1	1	2	3	2	15	11	26
“ Inflammation of.....	33	46	79	5	4	3	2	4	7	3	2	3	6	2	3	36	43	79
Bronchitis.....	31	31	62	4	9	5	4	8	4	4	2	2	2	1	1	31	31	62
Cancer (various) .....	41	29	70	3	4	1	1	3	5	2	2	5	2	3	2	27	43	70

## CAUSES OF DEATH.

CAUSES OF DEATH.	PARENTAGE.												SEX.					
	Am.	For.	Total.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	M.	F.	Total.
Cancer of Breast.....	4	6	10	1	1	1	2		2				1			1		10
" of Stomach.....	13	11	24	1	1	1	1	1	2	1	3	1	1	1	2	1	12	12
" of Uterus.....	12	9	21		3	1	1		1	3		4	2	3		1	21	21
Carum Oris.....	1		1	1		1											1	1
Canule.....	1		1										1				1	1
rh.....	-2	3	5			1			1	1	1	1				2	3	5
litis, Pelvic.....	1	1				1		1									1	1
gen Pox.....	1	1						1										1
1-birth.....	12	14	26	3	2	1	3		1	3	1	1	2	1		7	26	26
" Puerperal Convulsions.	4	4	8		1	1				1	1		2			2	8	8
" Puerperal Fever.....	5	4	9		2	1	1		1		1		1	1		1	9	9
Cholera Infantum.....	71	90	161		1	1	1	1	1	2	2	3	7	7	2		88	73
" Morbus.....	1	7	8							1	2	3	2				3	8
Colic.....	7	2	9	1	1			2	2	1		1		1			6	3
Consumption.....	278	359	637	36	34	27	28	37	31	24	25	22	25	16	20	16	30	637
Convulsions.....	37	62	99	5	6	7	2	1	4	5	2	6	1	4	1	5	6	99
Croup.....	40	56	96	8	7	6	7	11	4	4	3	2	3	4	1	1	3	96
Debility.....	34	49	83	2	5	3	2	6	3		3	2	4	2	1	4	5	83
" Birth Premature.....	7	9	16				2	2			1			4		2		16
Diabetes.....	11	4	15	1	1	1	1		1	1	1	2		1	1		8	15
Diarrhoea.....	17	28	45	1	1	1			1	2	2	5	8	7	6	1	25	45
" Chronic.....	5	3	8				2										3	8
Diphtheria.....	143	116	259	9	11	5	12	9	11	13	3	7	5	10	6	7	14	259
Dropsy.....	35	15	50	1	2	2	3	4	1	3	1	3	4	2	3		2	50
" of Chest.....	4		4						1	1		1	1			1	2	4
Dysentery.....	23	18	41						3	1		7	7		5	2	1	41
" Typhoid.....	2	1	3	1								1					2	3

TABLE VIII.—CAUSES OF DEATH, 1879.

Arranged Alphabetically; showing the Number of each Sex, who died from each cause, in each Month and in the whole year 1879; also the Number of American and of Foreign Parentage, from each cause, for the year.

CAUSES OF DEATH.	PARENTAGE.		Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	SEX.		
	Am.	For.	Total.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
Accidents (various) .....	14	22	36	3	3	4	2	1	1	1	3	1	2	2	2	25	11
" Burns and Scalds.....	7	6	13	1	1	1	1	1	1	1	1	1	1	2	4	9	13
" Drowning.....	9	13	22	2	2	2	3	2	1	2	4	3	2	1	21	1	22
" Falls.....	9	7	16	2	2	2	2	1	2	2	1	1	2	1	11	5	16
" Poisoning.....	3	2	5	1	1	2	1	1	1	1	1	1	1	1	3	2	5
" Railroad.....	2	8	10	1	1	1	1	1	1	1	1	1	2	2	10	1	10
Abscesses .....	10	4	14	1	1	1	1	1	1	1	1	1	2	1	5	9	14
Aorta, Disease of.....	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2
Anæmia.....	5	2	7	2	1	1	1	1	1	1	1	1	1	1	2	5	7
Aneurism.....	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2
Apoplexy.....	84	53	137	9	4	1	9	4	9	8	10	7	6	5	8	5	69
Asthma.....	1	12	13	1	1	1	1	1	1	1	1	1	1	1	5	8	13
Bladder, Disease of .....	5	7	12	3	3	1	1	1	1	2	1	2	1	1	11	1	12
" Gravel and Calculus.....	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2
Bones, Disease of .....	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2
Bowels, Disease of.....	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2
Brain, Disease of.....	37	15	52	2	3	4	2	4	2	4	1	2	1	1	3	2	29
" Congestion of.....	12	14	26	3	1	2	3	1	1	3	1	2	1	2	3	2	15
" Inflammation of.....	33	46	79	5	4	3	2	4	7	3	2	3	6	2	3	3	36
Bronchitis.....	31	31	62	4	9	5	4	8	4	4	2	2	2	1	1	5	43
Cancer (various).....	41	29	70	3	4	1	1	3	5	2	2	5	2	2	3	2	27

## CAUSES OF DEATH.

CAUSES OF DEATH.	PARENTAGE.												SEX.																	
	Am.	For.	Total.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.		Oct.	Nov.	Dec.	M.	F.	Total.											
Cancer of Breast.....	4	6	10	1	1	1	2	2	2	2	2	2	1	1	1	1	10	10												
“ of Stomach.....	13	11	24	1	1	1	1	1	2	2	1	3	2	1	1	1	12	12												
“ of Uterus.....	12	9	21	3	3	1	1	1	3	3	4	2	3	3	1	1	21	21												
Cancerum Oris.....	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1												
Carbuncle.....	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1												
Catarrh.....	2	3	5	1	1	1	1	1	1	1	1	1	1	1	1	2	3	5												
Cellulitis, Pelvic.....	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1												
Chicken Pox.....	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1												
Child-birth.....	12	14	26	3	2	1	3	1	1	3	1	2	1	2	7	2	26	26												
“ Puerperal Convulsions.	4	4	8	1	1	1	1	1	1	1	1	1	1	2	2	2	8	8												
“ Puerperal Fever.....	5	4	9	2	2	1	1	1	1	1	1	1	1	1	1	1	9	9												
Cholera Infantum.....	71	90	161	1	1	1	1	1	1	2	25	35	37	18	7	7	88	161												
“ Morbus.....	1	7	8	1	1	1	1	1	1	1	2	3	2	2	2	2	3	8												
Colic.....	7	2	9	1	1	1	1	2	2	1	1	1	1	1	1	6	3	9												
Consumption.....	278	359	637	36	34	27	28	31	24	25	22	25	16	30	23	41	18	27	24	37	23	26	20	27	286	351	637			
Convulsions.....	37	62	99	5	6	7	2	1	4	5	2	6	1	4	5	6	8	9	4	6	2	2	1	4	3	5	51	48	99	
Croup.....	40	56	96	8	7	6	7	11	4	4	3	2	3	3	4	1	1	3	1	7	5	8	2	4	2	58	38	96		
Debility.....	34	49	83	2	5	3	2	6	3	3	2	4	2	1	4	7	5	1	4	5	6	4	4	2	3	39	44	83		
“ Birth Premature.....	7	9	16	1	1	1	1	1	1	1	1	1	1	1	2	1	2	1	4	2	2	2	2	2	2	6	10	16	16	
Diabetes.....	11	4	15	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	8	7	15	15	
Diarrhoea.....	17	28	45	1	1	1	1	1	1	1	2	2	5	8	7	6	6	1	1	1	1	1	1	1	1	25	20	45	45	
“ Chronic.....	5	3	8	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	5	8	8	
Diphtheria.....	143	116	259	9	11	5	12	9	11	13	3	7	7	6	17	7	5	10	6	7	14	17	23	20	11	8	121	138	259	
Dropsy.....	35	15	50	1	2	2	2	3	4	1	3	1	3	4	2	3	5	2	1	2	2	2	2	2	2	1	2	26	24	50
“ of Chest.....	4	4	8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	4	4	
Dysentery.....	23	18	41	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	18	23	41	
“ Typhoid.....	2	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	3	3	

TABLE VIII.—DEATHS, 1879.—Continued.

CAUSES OF DEATH.	PARENTAGE.												SEX.															
	Am.	Jan.		Feb.		Mar.		Apr.		May.		June.		July.		Aug.		Sept.		Oct.		Nov.		Dec.		M.	F.	Total.
		M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.			
Embolism and Thrombosis..	2	2					1																		1	1	2	
Enteritis.....	19	15	34	3	2	2			1	1	1	1	2	1	7	2		1	1	5	1	1	2		18	16	34	
Epilepsy.....	8	5	13	1	1							2		1			1	1				3	1	1	8	5	13	
Erysipelas.....	9	12	21	2	1	1	2	2	2	2	1	1	1	1	2					1	2		1		13	8	21	
Exposure to cold.....	1	2	3	1	1	1																			1	2	3	
Fever.....	4	6	10		1	1	2	1								1			1	1	1				3	7	10	
“ Gastric.....		1	1									1													1	1	2	
“ Remittent.....	1	1	2						1																2	1	3	
“ Typhoid.....	58	43	101	1	6	3	2	2	6	1	2	3	7	4	5	3	4	7	4	9	4	3	5	4	41	60	101	
Fits.....	5	5	5										2				1								2	3	5	
Gangrene.....	4	2	6	1	1	1							1	1	1	1									4	2	6	
“ Senile.....	7	7	7		1	1						1	1	1	1	1									5	2	7	
Heart, Diseases of.....	124	70	194	10	9	12	6	9	6	10	14	9	6	7	3	7	5	8	5	5	11	7	16	6	7	111	83	194
“ Hypertrophy of.....	3	5	8						1	1	1	2	1	1	1	1	1			3					1	3	5	
Hemorrhage.....	7	7	14	1							1	1	1	1	1	1	1	1	3		1	1	1	2	8	6	14	
“ from Lungs.....	5	3	8		1	1					1	1	1	1	2										5	3	8	
“ from Stomach.....	1	2	3	1							1									1	1			1	1	2	3	
Hernia.....	7	5	12	1			1	1	1			1	1	1	2					1			1	2	4	8	12	
Hip-Joint, Disease of.....	1	6	7								1	1		2	1										6	1	7	
Hooping Cough.....	22	21	43	3	1	1	2	1	2	1	4	2	3	3	3	1	2	1	3		1	2	1	3	17	26	43	
Hydrocephalus.....	25	32	57	2	2	5	4	5	1	3	3	2	2	1	3	2	7	3	1	3	1	4	2	2	33	24	57	
Inflammation.....	4	2	6		1	1						1					1								3	3	6	
Influenza.....	4	4	4		2							1													1	3	4	
Insanity.....	10	7	17	3			1					5			1	1	1	1				2	1	1	11	6	17	

## CAUSES OF DEATH.

CAUSES OF DEATH.	PERMANENCE.												SEX.																					
	Am.		Total.	Jan.		Feb.		Mar.		Apr.		May.		June.		July.		Aug.		Sept.		Oct.		Nov.		Dec.		M.	F.	Total.				
	M.	F.		M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.							
Intemperance.....	5	7	12	1	1	1								1	1					2		1				1	2			9	3	12		
“ Delirium Tremens.	1	2	3							1	1																			3	...	3		
“ Opium Eating.....	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		
Intussusception.....	2	...	2	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		
Jaundice.....	2	1	3							1	1			1																1	1	2	3	
Kidneys, Disease of.....	11	7	18	2	1	2	...	...	...	...	...	...	...	2	1	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		
“ Bright's Disease of.	33	28	61	4	3	1	1	4	3	2	2	6	...	2	2	6	1	3	1	6	1	4	1	...	...	...	...	...	...	...	...	...		
Lead Poisoning.....	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		
Laryngitis.....	1	1	2														1	1											2	...	...	2		
Leucocythemia.....	1	...	1																											1	...	...	1	
Liver, Disease of.....	24	20	44	3	2	1	1	3	4	3	1	3	1	2	1	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
“ Inflammation of.....	5	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Lungs, Disease of.....	5	7	12	1	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Malformations (all kinds)...	11	8	19	4	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Marasmus.....	28	21	49	1	1	1	3	...	...	...	...	...	...	2	4	4	6	2	2	5	...	3	2	1	1	2	...	...	...	...	...	...	...	
Menorrhagia.....	1	1	...							1																				2	...	...	...	...
Meningitis Cerebro-Spinal...	5	5	10	...	...	...	...	...	...	...	...	...	...	1	2		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
“ Spinal.....	6	...	6														2	2											...	...	...	...	...	
Murder.....	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Neuralgia.....	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Neglect.....	1	1	2											...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Old Age.....	152	68	220	17	23	8	13	5	13	6	12	7	6	5	8	5	8	13	6	13	7	8	4	12	4	9	...	...	...	...	...	...	...	...
Pharyngitis.....	1	...	1											...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Paralysis.....	62	21	83	2	4	2	5	2	2	4	6	4	...	4	1	3	2	5	4	8	3	+	3	2	2	5	6	...	...	...	...	...	...	...
Phlebitis.....	1	1	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Peritonitis.....	12	12	24			...	...	...	...	...	...	...	...	2	1	1	1	3	1	2	...	1	1	3	...	2	...	...	...	...	...	...	...	...



TABLE VIII.—DEATHS, 1879.—Continued.

CAUSES OF DEATH.		PARENTAGE.												SEX.					
		Am.	For.	Total.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.			Oct.	Nov.	Dec.	
					M. F.	M. F.	M. F.	M. F.	M. F.	M. F.	M. F.	M. F.	M. F.	M. F.	M. F.	M. F.	M.	F.	Total.
Phlegmasia Dolens	1	1																1	1
Pleurisy	2	7	9	1						1	1	1	1	1	1	2	4	5	9
Pneumonia	148	138	286	40	38	15	14	15	21	16	10	10	4	5	3	4	10	8	17
" Congestion of Lungs.	15	10	25	4	2	1	1	1	1	2	2	1	2	1	2	3	1	13	12
Prostate, Disease of	4		4										1	1	1	1	4		4
Pyæmia	4		4				1	1	1								1	3	4
Rachitis	1		1				1											1	1
Rheumatism	11	13	24	1	1	4	3			2	2		3	1	1	3	1	11	13
Scarlatina	130	181	311	9	6	9	6	5	7	5	9	7	2	3	4	3	8	6	15
Scrofula	5	7	12		1	2	1			1			4	1	1	1		5	7
Septicæmia	2		2	1					1									1	1
Skin, Disease of	2	1	3				1							1			2	1	3
Spine, Disease of	4	7	11					3	1				1	2		1	1	2	6
Stomach, Disease of	6	3	9	1			1	1	1	1	1	1	1	2		1		6	3
" Inflammation of	8	9	17	2	2		2		1	1	1	2	3	2		1		8	9
Suicide	5	8	13	1				1	2	1	2	1		1		3	1	10	3
Surgical Operations	2	2	4										2		1		4		4
Syphilis	2	1	3										1	1		1	1	2	3
" Congenital	6	1	7				1	1		1	1	1		1		1	3	4	7
Tabes Mesenterica	1	2	3										1			1	1	2	3
Teething	6	16	22	1			2			1	1	4	2	1	1	1	8	14	22
Tetanus and Tris. Nascen.	2	4	6									1	1	1	1		4	2	6
Thrush	1		1				1										1		1
Tuberculosis	19	17	36	2	2	3	2		1	4	6	1		1	3	1	1	15	21

CAUSES OF DEATH.	PARENTAGE.		Jan.		Feb.		Mar.		Apr.		May.		June.		July.		Aug.		Sept.		Oct.		Nov.		Dec.		sex.			
	Total.		M.		F.		M.		F.		M.		F.		M.		F.		M.		F.		M.		F.		M.		F.	
	Am.	For.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	Total.	
Tumor.....	13	4	17	..	1	..	3	..	1	..	4	..	1	2	..	..	1	2	..	2	..	1	16	17						
Uremia.....	2	..	2	..	..	..	1	..	1	..	..	..	..	1	..	..	..	1	..	..	..	1	1	2						
Worms.....	1	..	1	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1						
Unknown.....	123	131	254	14	16	7	12	11	16	9	8	7	10	10	10	11	14	16	11	8	12	6	13	11	6	9	7	119	135	254

TABLE IX.—CAUSES OF DEATH, 1879.

*Arranged Alphabetically; showing the Number of each Sex, who died from each cause, in each Period of Life.*

CAUSES OF DEATH.	Under 1.		1 and under 2.		2 to 5.		5 to 10.		10 to 15.		15 to 20.		20 to 30.		30 to 40.		40 to 50.		50 to 60.		60 to 70.		70 to 80.		80 and over.		Age not stated.		SEX.		Total.
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
Accidents (various).....	3	2			3	2	3	1	2	..	2		1	..	3	1	2	..	1	1	3	2	1	..	1	2	..	25	11	36	
“ Burns and Scalds.....	1	1	2	2	1	..	..	..	..	..	..	1	1	..	..	..	2	..	..	..	..	..	1	..	..	..	1	4	9	13	
“ Drowning.....	..	1	1	2	..	3	..	3	..	..	..	3	..	7	..	2	..	2	..	..	..	..	..	..	..	..	21	1	22		
“ Falls.....	1	..	..	1	1	2	..	..	..	..	..	..	2	..	..	..	3	1	1	1	2	1	1	..	..	..	11	5	16		
“ Poisoning.....	..	..	1	1	..	..	..	..	..	..	..	..	1	..	1	..	1	..	..	..	..	..	..	..	..	..	3	2	5		
“ Railroad.....	..	..	..	..	1	..	..	1	..	..	1	3	1	..	2	..	2	..	..	..	2	..	..	..	..	..	10	..	10		
Abscesses.....	1	1	1	..	1	..	1	..	1	..	2	1	3	..	1	..	1	..	..	..	2	1	..	..	..	..	5	9	14		
Anæmia.....	..	..	..	..	..	1	..	1	..	..	..	..	1	..	1	..	1	..	..	..	1	1	..	..	..	..	2	5	7		
Aneurism.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	1		
Aorta, Disease of.....	..	..	..	..	..	..	..	..	..	..	..	..	3	2	3	6	6	5	14	6	19	12	17	25	7	12	..	69	68	137	
Apoplexy.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	2	1	1	3	1	2	..	..	..	5	8	13		
Asthma.....	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	2	..	..	..	7	..	1	..	..	..	11	1	12		
Bladder, Disease of.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	2	..	..	..	..	..	..	..	..	..	1	1	2	
“ Gravel and Calculus.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..	1	..	..	..	1	1	2		
Bones, Disease of.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..	1	..	..	..	1	1	2		
Bowels, Disease of.....	1	..	..	..	2	..	..	..	..	..	..	..	1	6	3	1	..	5	3	5	4	5	3	1	..	..	29	23	52		
Brain, Disease of.....	2	5	1	1	..	2	..	..	..	..	..	..	2	1	1	2	..	1	2	..	1	2	4	1	..	..	15	11	26		
“ Congestion of.....	3	1	2	1	2	2	..	..	..	..	..	..	..	..	..	..	1	3	2	..	1	1	1	1	..	..	36	43	79		
“ Inflammation of.....	10	6	7	13	7	8	2	8	2	2	..	2	1	..	1	..	2	2	..	2	3	5	3	1	8	..	31	31	62		
Bronchitis.....	14	10	4	3	3	1	..	..	..	..	..	..	1	..	2	5	4	5	3	11	7	10	6	8	4	3	..	27	43	70	
Cancer (various).....	..	..	..	..	..	..	..	..	..	..	..	..	1	..	2	5	4	5	3	11	7	10	6	8	4	3	..	1	27	43	

## CAUSES OF DEATH.

CAUSES OF DEATH.																															
Under 1.		1 and under 2.		3 to 5.		5 to 10.		10 to 15.		15 to 20.		20 to 30.		30 to 40.		40 to 50.		50 to 60.		60 to 70.		70 to 80.		80 and over.		Age not stated.		SEX.		Total.	
M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.		M.
Cancer of Breast																															
" of Stomach																															
" of Uterus																															
Cancerum Oris																															
Carbuncle																															
Catarth.																															
Cellulitis, Pelvic																															
Chicken Pox																															
Child-birth																															
" Puerperal Convulsions.																															
" Puerperal Fever.																															
Cholera Infantum.																															
" Morbus.																															
Colic																															
Consumption.																															
Convulsions																															
Croup.																															
Debility																															
" Birth Premature.																															
Diabetes.																															
Diarrhoea																															
" Chronic																															
Diphtheria																															
Dropsy																															
" of Chest																															

TABLE IX.—CAUSES OF DEATH, 1879.

*Arranged Alphabetically; showing the Number of each Sex, who died from each cause, in each Period of Life.*

CAUSES OF DEATH.	Under 1.		1 and under 2.		2 to 5.		5 to 10.		10 to 15.		15 to 20.		20 to 30.		30 to 40.		40 to 50.		50 to 60.		60 to 70.		70 to 80.		80 and over.		Age not stated.		SEX.		Total.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.		
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.		M.
Accidents (various) .....	3	2			3	2	3	1	2		2		1		3	1	2		1	1	3	2	1		1	2			25	11	36	
“ Burns and Scalds. ....	1		1	1	2	2	1						1	1				2										1	4	9	13	
“ Drowning. ....			1	1	2		3		3				3		7		2											21	1	22		
“ Falls. ....	1					1		2							2				3		1	1	2	1	1			11	5	16		
“ Poisoning. ....					1	1									1				1									3	2	5		
“ Railroad. ....											1		3		1		2						2					10			10	
Abscesses. ....	1	1	1				1				2	1	3								2	1						5	9	14		
Anæmia. ....									1				1		1		1				1							1	2	5	7	
Aneurism. ....																	1											1		1		1
Aorta, Disease of. ....																		1										1		1		1
Apoplexy. ....													3	2	3	6	5	14	6	19	12	17	25	7	12			69	68	137		
Asthma. ....	1														1		1	2	1	3	1	2						5	8	13		
Bladder, Disease of. ....																	1	1	2			7	1					11	1	12		
“ Gravel and Calculus. ....																								1					1	1	1	1
Bones, Disease of. ....															1													1	1	1	2	
Bowels, Disease of. ....	1																				1							1	1	1	2	
Brain, Disease of. ....	2	5	1	1			2						1		6	3	1	5	3	5	4	5	3	1				29	23	52		
“ Congestion of. ....	3	1	2	1	2	2							2	1	1	2					1	2	4	2	1			15	11	26		
“ Inflammation of. ....	10	6	7	13	7	8	2	2				2	1		1		1	3	2		1	1	1					36	43	79		
Bronchitis. ....	14	10	4	3	3	1							1				2	2			2	3	5	3	1	8			31	31	62	
Cancer (various) .....													1		2	5	4	5	3	11	7	10	6	8	4	3		1	27	43	70	

CAUSES OF DEATH.	Under 1.		1 and under 2.		3 to 5.		5 to 10.		10 to 15.		15 to 20.		20 to 30.		30 to 40.		40 to 50.		50 to 60.		60 to 70.		70 to 80.		80 and over.		Age not stated.		SEX.		Total.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.		
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.		M.
Cancer of Breast																															10	10
" of Stomach																															12	24
" of Uterus																															21	21
Cancerum Oris																															1	1
Carbuncle																															1	1
Catarrh	1	2	1																												2	3
Cellulitis, Pelvic																															1	1
Chicken Pox	1																														1	1
Child-birth																															1	1
" Puerperal Convulsions.																															26	26
" Puerperal Fever																															8	8
Cholera Infantum	74	59	11	10	1	4	2																								9	9
" Morbus																															88	73
Colic																															3	5
Consumption	6	4	2	4	2	4	3	2	5	12	17	45	94	92	54	65	38	43	28	40	23	22	10	14	2	3	2	1	286	351	637	
Convulsions	37	28	4	8	7	12	5																								51	48
Croup	8	3	15	12	26	14	9																								58	38
Debility	24	24	2				8						1	2	1	1	3		2	3	5	11								39	44	
" Birth Premature	6	10																													6	10
Diabetes																															8	7
Diarrhoea	15	14	3	4																											25	20
" Chronic																															3	5
Diphtheria	10	13	22	19	51	57	30	33	5	6	3	4	2	1	1	1	2													121	138	
Dropsy																															26	24
" of Chest																															2	2

TABLE IX.—CAUSES OF DEATH, 1879.—Continued.

CAUSES OF DEATH.	Under 1.		1 and under 2.		2 to 5.		5 to 10.		10 to 15.		15 to 20.		20 to 30.		30 to 40.		40 to 50.		50 to 60.		60 to 70.		70 to 80.		80 and over.		Age not stated.		SEX.						
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	Total.				
Dysentery.....	3	5	5	1	3	2	1	1	1	1	1	1	1	3	2	1	1	2	3	2	2	1	1	1	1	18	23	41	2	1	3				
“ Typhoid.....																															2	1	3		
Embolism and Thrombosis.....																															1	1	2		
Enteritis.....	4	3	6	1						1	1	1	1	3	1	1	3	2	3	4						18	16	34			18	16	34		
Epilepsy.....																															8	5	13		
Erysipelas.....	3	1			1	1	2	1					1	1	2	2	1	1	2	1	1	1	1	1	1	13	8	21			13	8	21		
Exposure to cold.....																															1	2	3		
Fever.....	1				1	1	1	2					1													3	7	10			3	7	10		
“ Gastric.....																															1	1	2		
“ Remittent.....																															1	1	2		
“ Typhoid.....	1		2	1	4	8	1	4	3	11	12	12	8	7	4	1	1	2	2	9	2	3	2	1		41	60	101			41	60	101		
Fits.....																															2	3	5		
Gangrene.....																															4	2	6		
“ Senile.....																															5	2	7		
Heart, Diseases of.....	1	1			2	3	4	1	1	3	1	6	2	5	6	11	14	23	10	23	26	26	9	7		111	83	194			111	83	194		
“ Hypertrophy of.....								2																							3	5	8		
Hemorrhage.....	2																														8	6	14		
“ from Lungs.....			1																												5	3	8		
“ from Stomach.....																															1	2	3		
Hernia.....																															4	8	12		
Hip-Joint, Disease of.....					2	1	2	1	1																							6	1	7	
Hooping Cough.....	12	13	3	5	2	4	3																										17	26	43
Hydrocephalus.....	15	10	8	5	8	6	2	2																									33	24	57





TABLE IX.—CAUSES OF DEATH, 1879.—Continued.

CAUSES OF DEATH.	1 and under 2.		2 to 5.		5 to 10.		10 to 15.		15 to 20.		20 to 30.		30 to 40.		40 to 50.		50 to 60.		60 to 70.		70 to 80.		80 and over.		Age not stated.		SEX.		Total.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.		
	Under 1.	2.	1.	2.	1.	2.	1.	2.	1.	2.	1.	2.	1.	2.	1.	2.	1.	2.	1.	2.	1.	2.	1.	2.	1.	2.	1.	2.		1.
Pharyngitis.....	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1
Paralysis.....	1	...	...	...	1	1	...	...	...	1	1	1	1	1	3	4	5	2	19	7	9	10	6	11	...	...	45	38	83	
Phlebitis.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1	...	...	...	...	...	...	...	1	1	2	
Peritonitis.....	...	...	1	1	...	...	...	...	...	2	6	...	2	1	2	1	1	1	1	1	2	1	...	...	...	9	15	24		
Phlegmasia Dolens.....	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	1	
Pleurisy.....	...	...	...	...	...	...	...	...	...	...	1	1	1	1	1	3	...	2	...	...	...	...	...	...	...	4	5	9		
Pneumonia.....	29	18	11	16	13	5	2	6	1	1	2	4	9	10	14	11	13	18	16	19	11	24	8	9	...	135	151	286		
“ Congestion of Lungs.	4	3	1	1	1	...	...	...	...	...	1	2	1	1	1	1	1	1	2	1	2	2	...	...	...	13	12	25		
Prostate, Disease of.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	1	1	...	...	...	4	...	4	4		
Pyæmia.....	...	...	...	...	1	...	...	...	...	1	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	1	3	4	1	
Rachitis.....	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1		
Rheumatism.....	...	...	...	...	2	2	...	...	...	1	2	1	1	1	4	1	...	3	3	1	1	...	...	...	...	11	13	24		
Scarlatina.....	4	7	19	17	78	61	51	48	6	10	...	2	2	1	1	1	...	1	...	...	...	...	...	1	...	164	147	311		
Scrofula.....	1	2	2	1	1	2	...	1	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	5	7	12		
Septicæmia.....	...	...	...	...	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	2		
Skin, Disease of.....	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	...	...	...	2	1	3		
Spine, Disease of.....	1	1	1	...	...	1	...	...	...	1	1	...	...	...	1	1	1	...	...	...	...	...	...	...	...	1	6	5	11	
Stomach, Disease of.....	...	...	...	...	1	...	...	...	...	...	...	...	...	...	2	1	2	...	1	1	1	...	...	...	...	6	3	9		
“ Inflammation of.....	2	...	...	...	2	...	...	...	1	...	1	1	1	1	1	1	4	1	3	...	...	...	...	...	...	10	3	13		
Suicide.....	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	3	...	...	...	...	...	...	4	...	4	4	
Surgical Operations.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	2	3		
Syphilis.....	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	2	3	
“ Congenital.....	3	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	3	4	7		

CAUSES OF DEATH.	Under 1.		1 and under 2.		2 to 5.		5 to 10.		10 to 15.		15 to 20.		20 to 30.		30 to 40.		40 to 50.		50 to 60.		60 to 70.		70 to 80.		80 and over.		Age not stated.		SEX.			
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	Total.	
Tabes Mesenterica . . . . .	1	1					1																							1	2	3
Teething . . . . .	3	5	8	1																										8	14	22
Tetanus and Tris. Nascen. . . . .	2				2														2										4	2	6	
Thrush . . . . .		1																											1		1	
Tuberculosis . . . . .	4		1	1	1	1	1	1	1	5	10	4	1	1					2	2	2								15	21	36	
Tumor . . . . .											2	1	2					1	3	4	3	1							1	16	17	
Uræmia . . . . .												1																	1	1	2	
Worms . . . . .																														1	1	
Unknown . . . . .	48	43	11	8	5	12	6	3	4	2	5	5	7	3	6	8	8	5	7	9	9	11	12	3	11	1	2	119	135	254		

TABLE X.—CLASSIFICATION AND PERCENTAGE, 1879.

*Showing what part of the Mortality in the whole State, and in each Division is ascribed to each cause and class of causes.*

NUMBER OF DEATHS IN EACH DIVISION OF THE STATE.				PERCENTAGE OF DEATHS IN EACH DIVISION.						
				CAUSES OF DEATH.						
				Percentage in the Whole State.						
				CAUSES OF DEATH.						
				Percentage in the Whole State.						
				CAUSES OF DEATH.						
				Percentage in the Whole State.						
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				CAUSES OF DEATH.						
				Percentage in the Whole State.						



TABLE X.—CLASSIFICATION AND PERCENTAGE, 1879.—Continued.

NUMBER OF DEATHS IN EACH DIVISION OF THE STATE.							PERCENTAGE OF DEATHS IN EACH DIVISION.							
CAUSES OF DEATH.							Percentage in the Whole State.							
Bristol County.	Newport County, Towns.	Newport City.	Providence County, Towns.	Providence City.	Washington County.	Whole State.	Bristol County.	Kent County.	Newport County, Towns.	Newport City.	Providence County, Towns.	Newport City.	Kent County.	Bristol County.
3	5	3	4	26	4	50	1.19	2.27	.20	2.11	1.67	3.30	1.81	2.13
..	1	1	2	2	8	1	.31	.45	.40	.16	..	1.10	.36	..
1	2	1	1	9	3	17	.40	..	.15	.73	.42	1.10	.72	.71
..	1	..	..	3	..	6	.14	.91	..	.24	..	..	.36	..
..	..	..	..	..	1	1	.02	..	.05	..	..	..	..	..
..	2	..	1	3	12	19	.45	.45	.59	.24	.42	..	.72	..
2	..	6	13	28	28	49	1.16	..	1.39	1.05	2.51	1.10	..	1.42
..	1	..	..	..	..	1	.02	..	..	..	..	..	..	..
..	..	..	7	5	..	12	.28	..	.25	.57	..	..	..	..
..	..	..	1	..	1	1	.02	..	..	.08	..	..	..	..
2	4	1	8	20	20	36	.85	.45	.99	.65	.42	..	1.44	1.42
..	4	1	3	3	7	17	.40	.91	.35	.24	..	1.10	1.44	..
23	29	12	32	159	192	468	11.09	9.55	9.52	12.90	13.39	13.19	10.47	16.31
Total.....														
III. NERVOUS SYSTEM.														
3	4	4	17	45	58	137	3.24	2.73	2.88	3.65	7.12	4.40	1.44	2.13
..	4	1	3	6	12	26	.62	..	.59	.49	1.25	1.10	1.44	..
1	1	3	1	22	23	52	1.23	.45	1.14	1.78	.42	3.30	.36	.71

2	8	7	22	40	79	Brain, Inflammation of.....	1.88	.....	1.98	1.78	2.93	.....	2.89	1.42
1	6	1	25	59	104	Convulsions and Fits.....	2.47	.91	2.92	2.03	4.18	1.10	2.17	.71
.....	1	.....	.....	2	3	Delirium Tremens.....	.07	.....	.10	.....	.....	.....	.36	.....
1	1	.....	3	6	13	Epilepsy.....	.31	.91	.30	.24	.....	.....	.36	.71
2	4	1	13	35	57	Hydrocephalus.....	1.36	.....	1.73	1.05	.84	1.10	1.44	1.42
.....	.....	.....	5	11	17	Insanity.....	.40	.45	.54	.41	.....	.....	.....	.....
.....	.....	.....	1	5	16	Meningitis, Spinal.....	.14	2.27	.....	.08	.....	.....	.....	.....
.....	.....	.....	1	.....	1	Neuralgia.....	.02	.....	.....	.08	.....	.....	.....	.....
9	5	6	26	31	83	Paralysis.....	1.97	1.82	1.54	2.11	.84	6.59	1.81	6.38
.....	.....	3	1	2	6	Tetanus and Tris. Nascentium.....	.14	.....	.10	.08	1.25	.....	.....	.....
19	34	16	45	170	584	Total.....	13.85	9.55	13.83	13.78	18.82	17.58	12.28	13.48
IV. RESPIRATORY SYSTEM.														
.....	1	1	8	3	13	Asthma.....	.31	.....	.15	.65	.42	.....	.36	.....
1	1	5	21	34	62	Bronchitis.....	1.47	.....	1.68	1.70	2.09	.....	.36	.71
.....	.....	1	3	1	5	Catarrh.....	.12	.....	.05	.24	.42	.....	.....	.....
16	38	10	35	197	637	Consumption.....	15.09	21.83	14.53	15.98	14.64	10.99	13.72	11.35
.....	2	.....	2	.....	4	Dropsy of Chest.....	.09	.....	.....	.16	.....	.....	.72	.....
.....	1	2	.....	3	8	Hemorrhage from Lungs.....	.19	.....	.15	.16	.....	2.20	.36	.....
.....	.....	.....	1	1	2	Laryngitis.....	.05	.....	.05	.08	.....	.....	.....	.....
1	.....	.....	7	4	12	Lungs, Disease of.....	.28	.....	.20	.57	.....	.....	.....	.71
.....	.....	.....	.....	1	1	Pharyngitis.....	.05	.....	.05	.....	.....	.....	.05	.....
6	3	.....	1	4	9	Pleurisy.....	.21	.45	.20	.08	.....	.....	1.08	.....
6	15	4	11	94	286	Pneumonia.....	6.78	6.36	7.03	7.63	4.60	4.40	5.42	4.25
1	.....	.....	9	14	25	Pneumonia, Congestion of Lungs.	.59	.45	.69	.73	.....	.....	.....	.71
25	61	16	53	345	1,064	Total.....	25.22	29.09	24.79	27.98	22.18	17.58	22.02	17.73
V. CIRCULATORY SYSTEM.														
.....	.....	.....	.....	1	1	Aneurism.....	.02	.....	.05	.....	.....	.....	.....	.....
.....	.....	.....	.....	1	1	Aorta, Disease of.....	.02	.....	.05	.....	.....	.....	.....	.....

TABLE X.—CLASSIFICATION AND PERCENTAGE, 1879.—Continued.

NUMBER OF DEATHS IN EACH DIVISION OF THE STATE.						PERCENTAGE OF DEATHS IN EACH DIVISION.						
Bristol County.	Kent County.	Newport County, Towns.	Newport City.	Providence County, Towns.	Providence City.	Washington County.	Providence City.	Providence County, Towns.	Newport City.	Newport County, Towns.	Kent County.	Bristol County.
CAUSES OF DEATH.							Percentage in the Whole State.					
							Whole State.					
8	20	4	12	1	1	2	Embolism and Thrombosis	.05	.05	.08		
1	1	1	1			202	Heart, Diseases of	4.78	4.09	3.08	7.22	5.67
						2	Phlebitis	.05		1.10		.71
9	20	5	12	39	114	208	Total	4.93	4.09	3.16	7.22	6.38
VI. DIGESTIVE SYSTEM.												
3	1			2		2	Bowels, Diseases of	.05		.16		
				1	2	9	Colic	.21	.91	.08	.36	2.13
	4	3	1	9	16	34	Enteritis	.81	.45	.79	1.44	
1	1			4	6	12	Hernia	.28		.30	.36	.71
				1	1	2	Intussusception	.05		.08		
	1			1	1	3	Jaundice	.07		.05	.36	
4	3	1	1	13	21	49	Liver, Diseases of	1.17	2.73	1.04	1.10	2.84
2			1	6	14	24	Peritonitis	.57	.45	.49		1.42
	1		1	7	15	26	Stomach, Diseases of	.62	.91	.74	.36	
					3	3	Tabes Mesenterica	.07		.15		
1	1			7	13	22	Teething	.52		.57	.36	.71





TABLE X.—CLASSIFICATION AND PERCENTAGE, 1879.—Continued.

NUMBER OF DEATHS IN EACH DIVISION OF THE STATE.							PERCENTAGE OF DEATHS IN EACH DIVISION.									
Bristol County.	Kent County.	Newport County.	Newport City.	Providence County.	Providence City.	Washington County.	Whole State.	CAUSES OF DEATH.	Percentage in the Whole State.	Washington County.	Providence City.	Providence County.	Newport City.	Newport County.	Kent County.	Bristol County.
8	20	4	12	38	111	9	202	2 Embolism and Thrombosis	.05	1	1	1	1	1	1	1
1	1	1	1	1	1	1	2	202 Heart, Diseases of	4.78	4.09	5.50	3.08	5.02	4.40	7.22	5.67
							2	Phlebitis	.05	1.10	1.10					.71
9	20	5	12	39	114	9	208	Total	4.93	4.09	5.65	3.16	5.02	5.49	7.22	6.38
VI. DIGESTIVE SYSTEM.																
3	1	1	1	2	2	2	2	Bowels, Diseases of	.05			.16				
4	3	1	1	9	16	1	34	Colic	.21	.91	.10	.08	.42	3.30	.36	2.13
1	1	1	1	4	6	1	12	Enteritis	.81	.45	.79	.73			1.44	
				1	1	1	2	Hernia	.28		.30	.32			.36	.71
				1	1	1	2	Intussusception	.05		.05	.08				
				1	1	1	3	Jaundice	.07		.05	.08			.36	
4	3	1	1	13	21	6	49	Liver, Diseases of	1.17	2.73	1.04	1.05	.42	1.10	1.08	2.84
2	1	1	1	6	14	1	24	Peritonitis	.57	.45	.69	.49	.42			1.42
1	1	1	1	7	15	2	26	Stomach, Diseases of	.62	.91	.74	.57	.42		.36	
1	1	1	1	1	3	1	3	Tabes Mesenterica	.07		.15					
1	1	1	1	7	13	1	22	Teething	.52		.64	.57			.36	.71



TABLE X.—CLASSIFICATION AND PERCENTAGE, 1879.—Continued.

NUMBER OF DEATHS IN EACH DIVISION OF THE STATE.						PERCENTAGE OF DEATHS IN EACH DIVISION.										
Bristol County.	Kent County.	Newport County, Towns.	Newport City.	Providence County, Towns.	Providence City.	Washington County.	Whole State.	CAUSES OF DEATH.	Percentage in the Whole State.	Washington County.	Providence City.	Providence County, Towns.	Newport City.	Newport County, Towns.	Kent County.	Bristol County.
CAUSES OF DEATH.																
Embolism and Thrombosis . . . . . 2 .05																
8	20	4	12	38	111	9	202	Heart, Diseases of . . . . . 2 4.78	4.09	5.50	.05	3.08	5.02	4.40	7.22	5.67
1	1	1	1				2	Phlebitis . . . . . 2 .05						1.10		.71
9	20	5	12	39	114	9	208	Total . . . . . 208 4.93	4.09	5.65	3.16	5.02	5.49	7.22	6.38	
VI. DIGESTIVE SYSTEM.																
Bowels, Diseases of . . . . . 2 .05																
3	1			2		2	9	Colic . . . . . 9 .21	.91	.10	.08				.36	2.13
							34	Enteritis . . . . . 16 1 .81	.45	.79	.73	.42	3.30		1.44	
1	1			4	6		12	Hernia . . . . . 6 .28		.30	.32				.36	.71
							2	Intussusception . . . . . 1 .05		.05	.08					
				1	1		3	Jaundice . . . . . 1 .07		.05	.08				.36	
4	3	1	1	13	21	6	49	Liver, Diseases of . . . . . 21 1.17	2.73	1.04	1.05	.42	1.10	1.08	2.84	
2				6	14	1	24	Peritonitis . . . . . 14 1 .57	.45	.69	.49	.42				1.42
	1		1	7	15	2	26	Stomach, Diseases of . . . . . 15 .62	.91	.74	.57	.42			.36	
					3		3	Tabes Mesenterica . . . . . 3 .07		.15						
1	1			7	13		22	Teething . . . . . 13 .52		.64	.57				.36	.71



TABLE X.—CLASSIFICATION AND PERCENTAGE, 1879.—Continued.

NUMBER OF DEATHS IN EACH DIVISION OF THE STATE.						PERCENTAGE OF DEATHS IN EACH DIVISION.					
Bristol County.	Kent County.	Newport County.	Newport Towns.	Providence County.	Washington County.	CAUSES OF DEATH.					
						Whole State.	X. INTEGUMENTIVE SYSTEM.				
1	1	1	1	1	1	3	3 Skin, Diseases of	07	10	36	Bristol County.
1	1	1	1	1	1	3	Total	07	10	36	Kent County.
14	19	8	18	71	25	220	XI. OLD AGE.	5.22	11.36	8.79	Newport County.
						XII. EXTERNAL CAUSES.					
4	2	1	1	7	22	36	Accidents (various)	.86	1.09	.42	Newport City.
1	1	2	2	9	1	13	" Burns and Scalds	.31	.45	.84	Providence Towns.
1	1	2	2	8	2	22	" Drowning	.52	.91	.84	Newport County.
2	1	1	1	5	8	16	" Falls	.38	.40	.42	Providence County.
1	1	1	1	3	1	5	" Poisoning	.12	.15	.42	Providence City.
1	1	1	1	3	5	10	" Railroad	.24	.25	.16	Washington County.
1	1	1	1	2	1	3	Exposure to cold	.07	.05	.32	Whole State.
1	1	1	1	4	6	13	Intemperance	.31	.91	.42	
1	1	1	1	1	1	1	Lead Poisoning	.02	.42	.42	

2	9	5	8	35	73	7	139	Total	3.30	3.18	3.61	2.84	3.35	5	49	3.25	1.42
...	...	...	...	...	1	...	...	1 Murder	.02	...	.05	...	...	...	...	...	...
...	...	...	...	...	2	...	...	2 Neglect	.05	...	.10	...	...	...	...	...	...
...	...	...	...	5	7	1	...	13 Suicide	.31	.45	.35	.41	...	...	...	...	...
...	...	...	...	1	3	...	...	4 Surgical Operations	.09	...	.15	.08	...	...	...	...	...

TABLE XI.—OCCUPATIONS AND AGES AT DEATH, 1879.

*Showing the Average Age at Death in the several occupations, Providence City being separated from the rest of the State, and ages under twenty being excluded.*

OCCUPATIONS.	WHOLE STATE.			PROVIDENCE CITY.			REST OF STATE.		
	Number who Died.	Aggregate Age.	Average Age.	Number who Died.	Aggregate Age.	Average Age.	Number who Died.	Aggregate Age.	Average Age.
<b>I. AGRICULTURE.</b>									
Farmers.....	177	11,734	66.29	13	747	57.46	164	10,987	66.99
Florists.....	4	211	52.75	2	92	46.00	2	119	59.50
Gardeners.....	4	307	76.75	4	307	76.75	.....	.....	.....
Nurserymen.....	2	96	48.00	1	61	61.00	1	35	35.00
<b>II. PROFESSIONAL AND PERSONAL SERVICES.</b>									
Army & Navy Officers.....	2	114	57.00	.....	.....	.....	2	114	57.00
Artists.....	2	64	32.00	.....	.....	.....	2	64	32.00
Barbers.....	10	330	33.00	5	127	25.40	5	203	40.60
Bill Poster.....	1	59	59.00	.....	.....	.....	1	59	59.00
Clergymen.....	9	595	66.11	4	200	50.00	5	395	79.00
Clerks.....	17	621	36.53	11	367	33.36	6	254	42.33
Couchmen.....	4	247	61.75	4	247	61.75	.....	.....	.....
Contractor.....	1	56	56.00	.....	.....	.....	1	56	56.00
Cook.....	1	29	29.00	1	29	29.00	.....	.....	.....
Dentist.....	1	55	55.00	.....	.....	.....	1	55	55.00
Editor.....	1	58	58.00	.....	.....	.....	1	58	58.00
Hostlers.....	4	131	32.75	2	51	25.50	2	80	40.00
Hotel Keepers.....	3	145	48.33	1	42	42.00	2	103	51.50
Inventor.....	1	62	62.00	1	62	62.00	.....	.....	.....
Janitors.....	4	215	53.75	4	215	53.75	.....	.....	.....
Laborers.....	212	11,192	52.79	111	5,888	53.04	101	5,304	52.51
Lawyers.....	5	255	51.00	3	119	39.67	2	136	68.00
Musicians.....	7	367	52.43	2	95	47.50	5	272	54.40
Physicians.....	10	697	69.70	1	80	80.00	9	617	68.55
Policemen.....	2	111	55.50	1	39	39.00	1	72	72.00
Postmaster.....	1	65	65.00	.....	.....	.....	1	65	65.00
Saloon Keepers.....	9	379	42.11	5	225	45.00	4	154	38.50
Sheriff.....	1	56	56.00	.....	.....	.....	1	56	56.00
Soldier.....	1	36	36.00	.....	.....	.....	1	36	36.00
Stewards.....	2	107	53.50	2	107	53.50	.....	.....	.....
Students.....	3	68	22.67	2	41	20.50	1	27	27.00
Surveyors.....	2	85	42.50	1	25	25.00	1	60	60.00
Teachers.....	2	144	72.00	2	144	72.00	.....	.....	.....
Undertakers.....	2	108	54.00	1	34	34.00	1	74	74.00
Waiter.....	1	75	75.00	1	75	75.00	.....	.....	.....
Watchmen.....	8	401	50.12	3	144	48.00	5	257	51.40

TABLE XI.—OCCUPATIONS, 1879.—Continued.

OCCUPATIONS.	WHOLE STATE.			PROVIDENCE CITY.			REST OF STATE.		
	Number who Died.	Aggregate Age.	Average Age.	Number who Died.	Aggregate Age.	Average Age.	Number who Died.	Aggregate Age.	Average Age.
<b>III. TRADE AND TRANSPORTATION.</b>									
Agents.....	2	83 41.50		2	83 41.50				
Apothecary.....	1	34 34.00					1	34 34.00	
Book-keepers.....	20	946 47.30		14	710 50.71		6	236 39.33	
Brokers.....	3	190 63.33					3	190 63.33	
Brakeman.....	1	32 32.00					1	32 32.00	
Butchers.....	7	376 53.71		5	246 49.20		2	130 65.00	
Cashier, (Bank and other).....	1	79 79.00					1	79 79.00	
Expressman.....	1	59 59.00					1	59 59.00	
Fishermen and Oystermen.....	8	374 46.75		3	133 44.33		5	241 48.20	
Grocers.....	8	472 59.00		7	402 57.43		1	70 70.00	
Hackman.....	1	25 25.00		1	25 25.00				
Insurance.....	4	246 61.50		4	246 61.50				
Liquor Dealers.....	4	186 46.50		3	125 41.67		1	61 61.00	
Marketmen.....	4	208 52.00		2	95 47.50		2	113 56.50	
Merchants.....	41	2,605 63.54		25	1,562 62.08		16	1,043 65.19	
Milkman.....	1	28 28.00					1	28 28.00	
Peddlers.....	9	497 55.22		7	382 54.57		2	115 57.50	
Pilot.....	1	63 63.00					1	63 63.00	
Porter.....	1	51 51.00		1	51 51.00				
R. R. Engineer and Fireman.....	1	64 64.00		1	64 64.00				
Sea Captains and Ship Masters.....	9	608 67.55		3	233 77.67		6	375 62.50	
Seamen.....	14	607 43.36		9	382 42.45		5	225 45.00	
Teamsters.....	7	344 49.14		3	173 57.67		4	171 42.75	
Traders and Dealers, (not specified)....	14	750 53.57		7	348 49.71		7	402 57.43	
<b>IV. MANUFACTURES, MECHANICAL AND MINING INDUSTRIES.</b>									
Assayer.....	1	69 69.00		1	69 69.00				
Bakers.....	5	338 67.60		2	127 63.50		3	211 70.33	
Blacksmiths.....	16	850 53.13		8	398 49.75		8	452 56.50	
Bleacher.....	1	21 21.00					1	21 21.00	
Boiler Makers.....	5	219 43.80		4	171 42.75		1	48 48.00	
Book-binder.....	1	67 67.00		1	67 67.00				
Box Makers.....	2	54 27.00		1	32 32.00		1	22 22.00	
Cabinet Makers.....	3	110 36.67		3	110 36.67				
Calico Printer.....	1	55 55.00		1	55 55.00				
Carpenters.....	56	3,207 57.27		28	1,589 56.75		28	1,618 57.71	



TABLE XI.—OCCUPATIONS, 1879.—Continued.

OCCUPATIONS.	WHOLE STATE.			PROVIDENCE CITY.			REST OF STATE.		
	Number who Died.	Aggregate Age.	Average Age.	Number who Died.	Aggregate Age.	Average Age.	Number who Died.	Aggregate Age.	Average Age.
Carriage Makers.....	3	159 53.00	1	35 35.00	2	124 62.00			
Cigar Makers.....	2	165 82.50	2	165 82.50	...	...			
Confectioner.....	1	38 38.00	1	38 38.00	...	...			
Coopers.....	2	56 28.00	1	28 28.00	1	28 28.00			
Cutlers.....	2	96 48.00	2	96 48.00	...	...			
Designer.....	1	76 76.00	...	...	1	76 76.00			
Draughtsman.....	1	23 23.00	...	...	1	23 23.00			
Dyer.....	1	85 85.00	1	85 85.00	...	...			
Engineers and Firemen.....	8	416 52.00	4	217 54.25	4	199 49.75			
Engraver.....	1	51 51.00	1	51 51.00	...	...			
File Cutters.....	2	67 33.50	2	67 33.50	...	...			
Gas Fitters.....	3	149 49.67	2	118 59.00	1	31 31.00			
Gunsmith.....	1	50 50.00	1	50 50.00	...	...			
Harness Makers and Saddlers.....	6	306 51.00	3	138 46.00	3	168 56.00			
Jewelers.....	20	793 39.65	18	745 41.39	2	48 24.00			
Machinists and Iron Workers.....	30	1,579 52.63	15	759 50.60	15	820 54.66			
Manufacturers.....	13	891 68.54	3	248 82.67	10	643 64.30			
Masons.....	15	852 56.80	8	448 56.00	7	404 57.71			
Mechanics.....	4	222 55.50	1	64 64.00	3	158 52.66			
Moulders.....	6	301 50.17	4	168 42.00	2	133 66.50			
Operatives.....	41	1,843 44.95	7	405 57.86	34	1,438 42.29			
Overseers and Superintendents.....	4	235 58.75	2	114 57.00	2	121 60.50			
Painters.....	20	1,017 50.85	13	691 53.16	7	326 46.57			
Pattern Makers.....	3	152 50.66	3	152 50.66	...	...			
Plumbers.....	3	124 41.33	2	94 47.00	1	30 30.00			
Pork Packer.....	1	40 40.00	1	40 40.00	...	...			
Printers.....	7	288 41.14	4	129 32.25	3	159 53.00			
Roll Coverers.....	2	130 65.00	2	130 65.00	...	...			
Rubber Workers.....	5	182 36.40	...	...	5	182 36.40			
Sail Maker.....	1	74 74.00	1	74 74.00	...	...			
Ship Carpenter.....	1	61 61.00	...	...	1	61 61.00			
Shoemakers.....	12	785 65.42	4	219 54.75	8	566 70.75			
Silversmiths.....	2	89 44.50	2	89 44.50	...	...			
Slater.....	1	50 50.00	1	50 50.00	...	...			
Stair Builder.....	1	55 55.00	...	...	1	55 55.00			
Stone Cutters.....	10	378 37.80	3	101 33.66	7	277 39.57			
Stucco Worker.....	1	24 24.00	1	24 24.00	...	...			
Tinsmiths.....	4	220 55.00	1	25 25.00	3	195 65.00			
Tailors.....	11	629 57.18	6	331 55.17	5	298 59.60			
Tanner.....	1	88 88.00	...	...	1	88 88.00			
Umbrella Maker.....	1	24 24.00	...	...	1	24 24.00			

TABLE XI.—OCCUPATIONS, 1879.—Concluded.

OCCUPATIONS.	WHOLE STATE.			PROVIDENCE CITY.			REST OF STATE.		
	Number who Died.	Aggregate Age.	Average Age.	Number who Died.	Aggregate Age.	Average Age.	Number who Died.	Aggregate Age.	Average Age.
Upholsterers .....	3	105	35.00	2	71	35.50	1	34	34.00
Watchmakers .....	3	161	53.67	1	25	25.00	2	136	68.00
Wheelwrights .....	4	272	68.00	2	123	61.50	2	149	74.50
Wood Carver .....	1	32	32.00	1	32	32.00	...	...	...
Wool Sorter .....	1	33	33.00	1	33	33.00	...	...	...
V. FEMALES.									
Box Maker .....	1	21	21.00	...	...	...	1	21	21.00
Clerk .....	1	28	28.00	1	28	28.00	...	...	...
Cooks .....	3	198	66.00	1	63	63.00	2	135	67.50
Dressmakers and Seamstresses .....	6	270	45.00	2	62	31.00	4	208	52.00
Nurses .....	2	166	83.00	1	96	96.00	1	70	70.00
Operatives .....	25	882	35.28	6	173	28.83	19	709	37.32
Tailoresses .....	2	77	38.50	1	32	32.00	1	45	45.00
Teachers .....	4	248	62.00	1	90	90.00	3	158	52.67
Upholsterer .....	1	34	34.00	1	34	34.00	...	...	...

TABLE XI.—RECAPITULATION BY CLASSES.

OCCUPATIONS.	WHOLE STATE.			PROVIDENCE CITY.			REST OF STATE.		
	Number who Died.	Aggregate Age.	Average Age.	Number who Died.	Aggregate Age.	Average Age.	Number who Died.	Aggregate Age.	Average Age.
I. AGRICULTURE.	187	12,348	66.03	20	1,207	60.35	167	11,141	66.71
II. PROFESSIONAL AND PERSONAL SERVICES .....	329	16,927	51.45	168	8,356	49.74	161	8,571	53.23
III. TRADE AND TRANSPORTATION .....	163	8,927	54.77	97	5,260	54.23	66	3,667	55.56
IV. MANUFACTURES, MECHANICAL AND MINING INDUSTRIES .....	357	18,456	51.70	179	9,090	50.78	178	9,366	52.62
V. FEMALES .....	45	1,924	42.75	14	578	41.29	31	1,346	43.42
ALL CLASSES. ...	1,081	58,582	54.19	478	24,491	51.24	603	34,091	56.54

TABLE XI.—OCCUPATIONS, 1879.—Continued.

OCCUPATIONS.	WHOLE STATE.			PROVIDENCE CITY.			REST OF STATE.		
	Number who Died.	Aggregate Age.	Average Age.	Number who Died.	Aggregate Age.	Average Age.	Number who Died.	Aggregate Age.	Average Age.
Carriage Makers . . . .	3	159 53.00		1	35 35.00		2	124 62.00	
Cigar Makers . . . . .	2	165 82.50		2	165 82.50		...	...	...
Confectioner . . . . .	1	38 38.00		1	38 38.00		...	...	...
Coopers . . . . .	2	56 28.00		1	28 28.00		1	28 28.00	
Cutlers . . . . .	2	96 48.00		2	96 48.00		...	...	...
Designer . . . . .	1	76 76.00		...	...		1	76 76.00	
Draughtsman . . . . .	1	23 23.00		...	...		1	23 23.00	
Dyer . . . . .	1	85 85.00		1	85 85.00		...	...	...
Engineers and Firemen . . . . .	8	416 52.00		4	217 54.25		4	199 49.75	
Engraver . . . . .	1	51 51.00		1	51 51.00		...	...	...
File Cutters . . . . .	2	67 33.50		2	67 33.50		...	...	...
Gas Fitters . . . . .	3	149 49.67		2	118 59.00		1	31 31.00	
Gunsmith . . . . .	1	50 50.00		1	50 50.00		...	...	...
Harness Makers and Saddlers . . . . .	6	306 51.00		3	138 46.00		3	168 56.00	
Jewelers . . . . .	20	793 39.65		18	745 41.39		2	48 24.00	
Machinists and Iron Workers . . . . .	30	1,579 52.63		15	759 50.60		15	820 54.66	
Manufacturers . . . . .	13	891 68.54		3	248 82.67		10	643 64.30	
Masons . . . . .	15	852 56.80		8	448 56.00		7	404 57.71	
Mechanics . . . . .	4	222 55.50		1	64 64.00		3	158 52.66	
Moulders . . . . .	6	301 50.17		4	168 42.00		2	133 66.50	
Operatives . . . . .	41	1,843 44.95		7	405 57.86		34	1,438 42.29	
Overseers and Superintendents . . . . .	4	235 58.75		2	114 57.00		2	121 60.50	
Painters . . . . .	20	1,017 50.85		13	691 53.16		7	326 46.57	
Pattern Makers . . . .	3	152 50.66		3	152 50.66		...	...	...
Plumbers . . . . .	3	124 41.33		2	94 47.00		1	30 30.00	
Pork Packer . . . . .	1	40 40.00		1	40 40.00		...	...	...
Printers . . . . .	7	288 41.14		4	129 32.25		3	159 53.00	
Roll Coverers . . . . .	2	130 65.00		2	130 65.00		...	...	...
Rubber Workers . . . .	5	182 36.40		...	...		5	182 36.40	
Sail Maker . . . . .	1	74 74.00		1	74 74.00		...	...	...
Ship Carpenter . . . .	1	61 61.00		...	...		1	61 61.00	
Shoemakers . . . . .	12	785 65.42		4	219 54.75		8	566 70.75	
Silversmiths . . . . .	2	89 44.50		2	89 44.50		...	...	...
Slater . . . . .	1	50 50.00		1	50 50.00		...	...	...
Stair Builder . . . . .	1	55 55.00		...	...		1	55 55.00	
Stone Cutters . . . . .	10	378 37.80		3	101 33.66		7	277 39.57	
Stucco Worker . . . . .	1	24 24.00		1	24 24.00		...	...	...
Tinsmiths . . . . .	4	220 55.00		1	25 25.00		3	195 65.00	
Tailors . . . . .	11	629 57.18		6	331 55.17		5	298 59.60	
Tanner . . . . .	1	88 88.00		...	...		1	88 88.00	
Umbrella Maker . . . .	1	24 24.00		...	...		1	24 24.00	

TABLE XI.—OCCUPATIONS, 1879.—Concluded.

OCCUPATIONS.	WHOLE STATE.			PROVIDENCE CITY.			REST OF STATE.		
	Number who Died.	Aggregate Age.	Average Age.	Number who Died.	Aggregate Age.	Average Age.	Number who Died.	Aggregate Age.	Average Age.
Upholsterers .....	3	105	35.00	2	71	35.50	1	34	34.00
Watchmakers .....	3	161	53.67	1	25	25.00	2	136	68.00
Wheelwrights .....	4	272	68.00	2	123	61.50	2	149	74.50
Wood Carver .....	1	32	32.00	1	32	32.00	...	...	...
Wool Sorter .....	1	33	33.00	1	33	33.00	...	...	...
<b>V. FEMALES.</b>									
Box Maker .....	1	21	21.00	...	...	...	1	21	21.00
Clerk .....	1	28	28.00	1	28	28.00	...	...	...
Cooks .....	3	198	66.00	1	63	63.00	2	135	67.50
Dressmakers and Seamstresses .....	6	270	45.00	2	62	31.00	4	208	52.00
Nurses .....	2	166	83.00	1	96	96.00	1	70	70.00
Operatives .....	25	882	35.28	6	173	28.83	19	709	37.32
Tailoresses .....	2	77	38.50	1	32	32.00	1	45	45.00
Teachers .....	4	248	62.00	1	90	90.00	3	158	52.67
Upholsterer .....	1	34	34.00	1	34	34.00	...	...	...

TABLE XI.—RECAPITULATION BY CLASSES.

OCCUPATIONS.	WHOLE STATE.			PROVIDENCE CITY.			REST OF STATE.		
	Number who Died.	Aggregate Age.	Average Age.	Number who Died.	Aggregate Age.	Average Age.	Number who Died.	Aggregate Age.	Average Age.
I. AGRICULTURE.	187	12,348	66.03	20	1,207	60.35	167	11,141	66.71
II. PROFESSIONAL AND PERSONAL SERVICES.....	329	16,927	51.45	168	8,356	49.74	161	8,571	53.23
III. TRADE AND TRANSPORTATION.....	163	8,927	54.77	97	5,260	54.23	66	3,667	55.56
IV. MANUFACTURES, MECHANICAL AND MINING INDUSTRIES .....	357	18,456	51.70	179	9,090	50.78	178	9,366	52.62
V. FEMALES....	45	1,924	42.75	14	578	41.29	31	1,346	43.42
ALL CLASSES. ..	1,081	58,582	54.19	478	24,491	51.24	603	34,091	56.54

TABLE XII.—OCCUPATIONS AND CAUSES OF DEATH, 1879.

*Deaths at ages under twenty years being excluded.*

OCCUPATIONS.	Whole Number of given causes.																																					
	Accidents.	Apoplexy and Paralysis.	Bladder, Disease of.	Brain, Disease of.	Bronchitis.	Cancer.	Cholera Morbus.	Colic.	Consumption.	Debility.	Diabetes.	Diarthra.	Dropsy.	Dysentery.	Enteritis.	Epilepsy.	Erysipelas.	Fever.	Gangrene.	Heart, Diseases of.	Hemorrhage.	Hernia.	Insanity.	Intemperance and Delirium Tremens.	Kidneys, Diseases of.	Liver, Diseases of.	Old Age.	Peritonitis.	Pneumonia.	Rheumatism.	Stomach, Diseases of.	Suicide.	Tuberculosis.	Tumor.				
I. AGRICULTURE.																																						
Farmers*.....	174	2	4	21	2	4	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6			
Florists.....	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
Gardeners.....	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
Nurserymen ..	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
II. PROFESSIONAL AND PERSONAL SERVICES.																																						
Army and Navy Officers.....	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
Artists.....	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
Barbers.....	10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
Bill Poster.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
Clergymen.....	8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
Clerks*.....	17	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
Coachmen.....	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
Cook.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
Dentist.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
Editor.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
Hostlers.....	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
Hotel Keepers.....	8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
Inventors.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
Janitors*.....	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
Laborers*.....	20	12	4	1	3	8	1	15	1	1	1	3	8	2	2	7	2	16	2	1	2	8	2	16	18	3	1	8	2	16	18	3	1	8	2	16		
Lawyers.....	5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
Musicians.....	7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
Physicians.....	9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
Police.....	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
Postmaster.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
Saloon Keepers*.....	6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			









TABLE XII.—OCCUPATIONS AND CAUSES OF DEATH, 1879.—Continued.

OCCUPATIONS.																																
Transfers.* Traders and Dealers (not specified).	Whole Number of given causes.		Causes.																													
	Accidents.	Apoplexy and Paralysis.	Brain, Diseases of.	Bronchitis.	Cancer.	Cholera Morbus.	Consumption.	Debility.	Diabetes.	Dropsy.	Dysentery.	Enteritis.	Epilepsy.	Erysipelas.	Fever.	Gangrene.	Heart, Diseases of.	Hemorrhage.	Hernia.	Insanity.	Intemperance and Delirium Tremens.	Kidneys, Diseases of.	Liver, Diseases of.	Old Age.	Peritonitis.	Pneumonia.	Rheumatism.	Stomach, Diseases of.	Suicide.	Tuberculosis.	Tumor.	
Assayer.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Bakers.	15	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Blacksmiths.	16	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Bleacher.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Boiler Makers.	5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Book-binder.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Box Makers.	5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Cabinet Makers.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Calico Printer.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Carpenters*.	2	2	1	5	5	1	12	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Carriage Makers.	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Cigar Makers.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Confectioner.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Coopers.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Cutlers.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Designer.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Draughtsman.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Dyer.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Engineers and Firemen*.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Engraver.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
File Cutters.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Gas Fitters.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Gunsmith.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Harness Makers and Saddlers.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Jewelers.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

## OCCUPATIONS.

OCCUPATIONS.	Whole Number of given causes.	DISEASES.																																			
		Abcesses.	Accidents.	Apoplexy and Paralysis.	Bladder, Disease of.	Brain, Diseases of.	Bronchitis.	Cancer.	Cholera Morbus.	Colic.	Consumption.	Debility.	Diabetes.	Diarrhea.	Dropsy.	Dysentery.	Enteritis.	Epilepsy.	Erysipelas.	Fever.	Gangrene.	Heart, Diseases of.	Hemorrhage.	Hernia.	Insanity.	Intemperance and Delirium Tremens.	Kidneys, Diseases of.	Liver, Diseases of.	Old Age.	Peritonitis.	Pneumonia.	Rheumatism.	Stomach, Diseases of.	Suicide.	Tuberculosis.	Tumor.	
Machinists and Iron Workers*.	20	1																																			
Manufacturers.	13	1																																			
Masons*.	13	1																																			
Mechanics.	3	1																																			
Moulders.	6	1																																			
Operatives*.	36	1																																			
Overseers and Superintendents*.	4	1																																			
Painters.	19	1																																			
Pattern Makers.	4	1																																			
Plumbers.	3	1																																			
Pork Packer.	3	1																																			
Printers.	1																																				
Roll Coverer.	1																																				
Rubber Workers.	5																																				
Sail Maker.	1																																				
Shoemakers.	11																																				
Silver-smiths.	2																																				
Slaters.	1																																				
Stair Builder.	1																																				
Stone Cutters.	8																																				
Stucco Worker.	1																																				
Tailors.	11																																				
Tinsmiths.	4																																				
Umbrella Maker.	1																																				
Upholsterers.	3																																				
Watchmakers.	8																																				
Wheelwrights.	4																																				
Wood Carver.	1																																				
Wool Sorter.	1																																				
Box Maker.	1																																				

## V. FEMALES.







## RESULTS AND OBSERVATIONS, 1879.

There were recorded in the State of Rhode Island during the year 1879, six thousand three hundred and fifty (6,350) births; two thousand three hundred and ninety-six (2,396) marriages; and four thousand four hundred and seventy-two (4,472) deaths.

TABLE XIII.

*Presenting the general results of Registration, in the State, during each of the last twenty-six years.*

Year.	Whole Number of Births.	Still-born.	Living Births.	Marriages.	Deaths.
1854.	2,105.	78.	2,027.	1,047.	1,730.
1855.	2,936.	124.	2,802.	1,375.	1,846.
1856.	2,906.	183.	2,723.	1,535.	2,042.
1857.	4,026.	185.	3,841.	1,526.	2,325.
1858.	4,263.	177.	4,086.	1,438.	2,616.
1859.	4,500.	177.	4,323.	1,672.	2,270.
1860.	4,600.	167.	4,433.	1,748.	2,086.
1861.	4,840.	146.	4,694.	1,538.	2,927.
1862.	4,125.	123.	4,002.	1,450.	2,591.
1863.	3,691.	111.	3,580.	1,618.	3,207.
1864.	3,892.	138.	3,754.	1,844.	3,360.
1865.	3,955.	177.	3,778.	1,896.	3,405.
1866.	4,902.	172.	4,730.	2,318.	2,970.
1867.	5,127.	163.	4,964.	2,344.	2,889.
1868.	5,372.	212.	5,160.	2,285.	2,912.
1869.	5,245.	220.	5,025.	2,289.	3,382.
1870.	5,215.	234.	4,981.	2,302.	3,238.
1871.	5,078.	223.	4,855.	2,336.	3,344.
1872.	6,143.	202.	5,941.	2,537.	4,247.
1873.	6,022.	228.	5,794.	2,630.	4,408.
1874.	6,466.	277.	6,189.	2,541.	4,229.
1875.	6,508.	246.	6,262.	2,485.	4,317.
1876.	6,329.	224.	6,105.	2,253.	4,116.
1877.	6,235.	242.	5,993.	2,282.	4,450.
1878.	6,714.	248.	6,466.	2,324.	4,441.
1879.	6,350.	216.	6,134.	2,396.	4,472.

The aggregates of the whole period of twenty-six years are as follows: Whole number of births, 128,195, of which 4,893 were still-born, and 123,302 were living children.

Of marriages, there were recorded 52,058, or 104,116 persons married; and the deaths of 84,405 persons.

On the next page the usual Table is given, showing a comparison of the births, marriages and deaths, with the population, in each town in the State, for the year 1879.

TABLE XIV.

BIRTHS, MARRIAGES AND DEATHS IN RHODE ISLAND,  
IN 1879, COMPARED WITH THE POPULATION  
BY THE CENSUS OF 1880.

TOWNS AND DIVISIONS OF THE STATE.	Population in 1880.	Births in 1879.	To population one birth in	Marriages in 1879.	To population one person married in	Deaths in 1879.	Of population one death in	Deaths in each 100 of the population.
Barrington.....	1,359	19	71.05	11	61.77	12	113.25	.88
Bristol.....	6,028	135	44.59	40	75.35	82	73.51	1.36
Warren.....	4,008	86	46.80	43	46.61	56	71.57	1.39
BRISTOL COUNTY.....	11,395	240	47.48	94	60.61	150	75.91	1.32
Coventry.....	4,520	75	60.27	28	80.71	64	70.63	1.42
East Greenwich.....	2,887	56	51.55	36	40.09	42	68.74	1.45
West Greenwich.....	1,018	24	42.29	6	84.83	22	46.27	2.16
Warwick.....	12,167	277	34.92	101	60.23	183	66.49	1.50
KENT COUNTY.....	20,502	432	47.67	171	60.21	311	66.21	1.51
Jamestown.....	459	6	76.5	4	57.37	2	22.95	.44
Little Compton.....	1,201	13	92.39	3	200.17	12	100.10	1.00
Middletown.....	1,139	26	43.81	2	284.75	15	75.8	1.32
New Shoreham.....	1,214	17	71.41	4	151.80	6	207.33	.49
Portsmouth.....	1,979	30	65.97	9	109.34	22	89.96	1.11
Tiverton.....	2,505	48	52.19	25	50.10	38	65.92	1.52
TOWNS, NEWPORT COUNTY.....	8,497	140	60.69	47	90.39	95	89.94	1.12
NEWPORT CITY.....	15,608	308	51.81	122	64.33	204	59.46	1.08
Burrillville.....	5,716	138	41.42	30	95.27	76	75.22	1.33
Cranston.....	5,941	113	52.57	11	270.04	121	49.10	2.04
Cumberland.....	6,445	154	41.85	45	76.61	81	79.57	1.26
East Providence.....	5,056	168	30.09	27	93.63	93	54.37	1.44
Foster.....	1,552	25	62.08	43	18.05	23	67.52	1.48
Glocester.....	2,250	47	47.87	24	46.88	33	68.15	1.47
Johnston.....	5,765	129	44.69	22	131.02	46	125.20	.80
Lincoln.....	13,867	283	49.00	75	92.40	190	72.78	1.37
North Providence.....	1,407	41	35.78	2	307.00	12	122.25	.82
North Smithfield.....	3,088	85	36.33	20	53.24	39	78.15	1.28
Pawtucket.....	19,061	483	39.92	172	55.41	319	59.75	1.67
Scituate.....	3,810	71	53.66	46	41.42	46	82.82	1.21
Smithfield.....	3,085	61	50.57	11	140.22	24	124.54	.78
Woonsocket.....	16,055	370	43.39	100	50.17	274	58.76	1.71
TOWNS, PROVIDENCE COUNTY.....	93,158	2,208	41.07	697	60.85	1,377	67.65	1.48
PROVIDENCE CITY.....	104,862	2,522	41.58	1,071	48.95	2,026	51.76	1.93
Charlestown.....	1,117	15	74.47	7	79.78	17	65.77	1.52
Exeter.....	1,310	31	42.26	13	50.39	16	81.87	1.22
Hopkinton.....	2,954	53	55.76	41	36.02	26	122.08	.88
North Kingstown.....	3,949	96	41.14	27	73.13	46	85.85	1.16
South Kingstown.....	5,125	100	51.25	39	65.72	59	86.56	1.15
Richmond.....	1,949	48	40.60	7	139.22	21	92.81	1.07
Westerly.....	6,104	100	61.04	60	50.87	64	92.25	1.06
WASHINGTON COUNTY.....	22,508	445	50.58	104	58.01	249	90.39	1.11
WHOLE STATE.....	270,710	6,350	43.58	2,396	57.75	4,472	61.87	1.62

As in preceding years, the proportion of births, marriages and deaths recorded in the several towns, compared with the population of the same, varies very greatly. This has been established as an invariable rule, and holds good, not only in the different towns in the same year, but also in the same towns in different years.

The highest percentage of births to population, according to the returns, was found in the town of East Providence, which reports one to every 30.09 of the inhabitants. This town also returned the highest proportional number of births in 1878, which was one birth to every 26.12 persons.

Following East Providence in a high birth rate, the town of Warwick returns one birth to every 34.92 persons, North Providence one to every 35.78, North Smithfield one to every 36.33, and Pawtucket one birth to every 39.92. In the last named towns, the proportions were higher than last year, with the exception of Pawtucket. It should be remembered that the proportions in this Report are based upon the enumeration by the Census of 1880, and the number of persons in most of the towns being larger than by the Census of 1875, the percentage of the same number, whether of births, marriages or deaths, would thereby be lessened.

The lowest proportion of births to population, was reported from the town of Little Compton, and was one to every 92.39. This town reported the low birth rate of one in every 128.44 in 1878.

Following Little Compton, the town of Jamestown reports one birth in every 76.50 persons, and Charlestown one in every 74.47.

The difference in the birth rate of Newport city in 1878, *i. e.*, one in every 29.68 persons, and the rate in 1879, *i. e.*, one in every 51.81, is quite remarkable.

The proportions of the aggregate births in the different counties, to the aggregate population, were as follows: Bristol, one birth to every 47.48 persons; Kent, one to every 47.67; Newport, one to every 54.61; Providence, one to every 41.33; and Washington, one to every 50.58. For the whole State, the proportion was one birth to every 43.58 persons.

It will be observed, that not only was there a less number of births in each of the counties in 1879 than in 1878, but by reason of the proportions being based on the increased population by the enumeration of 1880, the ratio was more than correspondingly decreased.

As in all previous years, the proportion of persons married, to the population of the different towns in which the events occurred, varied very greatly more than those of either births or deaths. The difference is very plainly shown by comparing the low marriage rates of North Providence, (in which town only two marriages were solemnized during 1879, according to the returns), that is, one person married to



showed that in North Middletown one person married to every one person, and Cranston one to every 17.1, with the higher rates of North Attle, one person married to every 10 persons in the town, and Foster the extraordinary high rate of one person married in every 19 of the population.

The town of Foster has had an increase in the order of a high marriage rate, almost constant, during the whole period of twenty-six years of registration.

It has been before mentioned that the small number of reported marriages in proportion to the population of some of the towns, was by no means a correct indication of the number of persons, residents of those towns, who had entered a contract of marriage. In North Providence and Cranston, for instance, hundreds of considerable number of the marriages of persons residing in those towns were, for various reasons, contracted in the city of Providence.

It was also shown by the statistics, that some of the marriages reported from towns having a high marriage rate, were not only of parties residing in other towns, but in some instances, from other States.

In the town of Foster, 15 out of the 41 marriages reported were of persons of whom no were residents of the State of Connecticut, and seven of the 41 marriages reported from Hingham were also wholly of persons resident in that State.

The average ratio of marriage to population of the several towns, when tabulated in columns, is more nearly uniform, although then showing considerable variation.

The proportions of the several counties, and the cities of Providence and Newport, are as follows:

Bristol County	One person married in every 20.5 of the population.
Kent County	One person married in every 30.2 of the population.
Newport County Towns	One person married in every 30.4 of the population.
Newport City	One person married in every 34.1 of the population.
Newport County	One person married in every 27.5 of the population.
Providence County Towns	One person married in every 41.5 of the population.
Providence City	One person married in every 40.3 of the population.
Providence County	One person married in every 40.2 of the population.
Washington County	One person married in every 30.1 of the population.
Whole State	One person married in every 37.4 of the population.

The extreme rates of mortality, as reported from the different towns, and shown in the preceding Table, were more variable than usual.

The highest rate was reported from West Greenwich, a town not normally presenting a high death rate, but returning for 1879 the large proportion of one death in every 49.37 of the population, or 21.6 decedents in each one thousand persons. Cranston follows with a pro-

portion of one death in every 49.1 of its inhabitants, or 20.4 in each one thousand. These proportions are larger than in the city of Providence, which reported a death rate of 19.3 decedents in each one thousand.

In regard to Cranston it should be said, however, that the large mortality reported was occasioned by the occurrence of 61 of the 121 deaths returned in the different State Institutions located in that town. But the low death rate of only one in 99 of the population, or about 10 in each one thousand, which would be the proportion after deducting the deaths at the State Farm, is strongly confirmatory of a suspicion that all the deaths elsewhere in the town were not returned.

The same may be said of the low death rates as reported from the towns of Smithfield, North Providence and Johnston. Any town reporting less than twelve decedents in each one thousand of the population, when that population is, to a considerable extent, located in manufacturing villages, cannot reasonably be exempt from the opinion that the returns are incomplete.

The town of Jamestown reports the minimum rate of mortality, that is, one death in every 229.5 of its inhabitants, or 4.4 in each one thousand. New Shoreham follows with one death in every 207, or 4.9 in each one thousand.

The following summary will show the death rate in each of the larger divisions of the State:

Bristol County.....	13.2 in each one thousand of the population.
Kent County.....	15.1 in each one thousand of the population.
Towns Newport County.....	11.2 in each one thousand of the population.
City of Newport.....	16.8 in each one thousand of the population.
Newport County.....	14.8 in each one thousand of the population.
Towns Providence County.....	14.8 in each one thousand of the population.
City of Providence.....	19.8 in each one thousand of the population.
Providence County.....	17.2 in each one thousand of the population.
Washington County.....	11.1 in each one thousand of the population.
Whole State.....	16.2 in each one thousand of the population.

It has been before observed, that the returns from the different towns of the number of births, marriages and deaths occurring in them respectively, vary so much, one year with another, that no approximate ratio of these events to the population in those towns can be determined, except by a comparison of the average number of each in the returns for a series of years; and that is also especially true of the average age of the decedents in the several towns.

The following Table has been prepared, at a very large expenditure of labor, to show more definitely and correctly the relations of the above events, in each of the several towns, to the population of the same, and also the average age of the decedents in each town, respectively, during a period of ten years.

TABLE XV.

*Showing the aggregate number of Births, Marriages and Deaths, in each town and in each county in the State, during the ten years from 1870 to 1879, inclusive, with the annual average and percentage of the same events, and the aggregate and average age of all the decedents in the same towns and counties for the same period of time.*

TOWNS AND DIVISIONS OF THE STATE.	Estimated Average Population, 1870 to 1879.	BIRTHS.		MARRIAGES.		DEATHS.						
		Whole No. Births, 1870-1879.	Average to population one in every	Per cent.	Whole No. Marriages, 1870-1879.	Average to population one person married in every	Per cent.	Whole No. Deaths, 10 years, 1870-1879.	Average to population one in every			
										Aggregate Age of all.	Per cent.	Average Age of all.
Barrington.....	1,185	156	75.96	1.81	63	94.04	1.06	142	83.45	1.19	6,123	43.12
Bristol.....	5,829	1,738	53.54	2.96	403	71.96	1.39	904	64.37	1.55	31,834	34.66
Warren.....	4,005	734	55.33	1.81	436	45.93	2.18	656	61.05	1.64	30,977	31.96
BRISTOL COUNTY.....	11,019	2,618	42.09	2.88	904	60.95	1.64	1,702	64.74	1.54	57,494	33.77
Coventry.....	4,580	754	60.74	1.65	393	63.09	1.58	672	68.15	1.47	27,400	40.77
East Greenwich.....	3,120	629	49.60	2.02	365	51.15	1.96	540	63.40	1.63	20,083	40.17
West Greenwich.....	1,634	244	42.79	2.94	75	62.26	1.77	177	58.42	1.71	8,102	45.78
Warwick.....	11,614	2,496	46.49	2.15	1,063	54.11	1.85	1,461	79.49	1.86	43,589	39.15
KENT COUNTY.....	20,346	4,125	49.33	2.02	1,806	56.83	1.77	2,810	72.41	1.83	99,174	35.29
James town.....	488	49	99.59	1.00	22	101.90	.98	42	116.19	.86	2,163	51.62
Little Compton.....	1,156	187	61.82	1.62	69	83.77	1.19	140	82.57	1.21	7,517	53.69
Middleton.....	1,074	195	55.06	1.82	49	109.56	.91	134	86.51	1.15	5,363	45.06
New Shoreham.....	1,147	206	55.15	1.81	80	71.69	1.31	111	103.33	1.96	4,151	37.89
Portsmouth.....	2,883	255	74.22	1.85	96	98.59	1.01	216	87.64	1.14	10,231	47.32
Tiverton.....	2,101	470	44.67	2.34	269	39.05	2.56	285	73.72	1.86	12,271	43.05
TOWNS, NEWPORT Co. . .	7,839	1,384	57.62	1.65	585	67.17	1.49	918	85.61	1.17	41,921	45.66
NEWPORT CITY.....	14,028	3,386	41.43	2.42	1,173	59.79	1.67	2,041	68.73	1.45	74,533	36.51
NEWPORT COUNTY.....	21,867	4,750	46.09	2.16	1,758	62.25	1.60	2,850	73.97	1.35	116,454	39.35

TOWNS AND DIVISIONS OF THE STATE.	Estimated Average Population, 1870 to 1879.	BIRTHS.			MARRIAGES.			DEATHS.		
		Whole No. Births, 1870-1879.	Average to population one in every	Per cent.	Whole No. Marriages, 1870-1879.	Average to population, one person married in every	Per cent.	Whole No. Deaths, 1870-1879.	Average to population one in every	Per cent.
Barrillville.....	5,249	1,140	46.06	2.17	320	82.03	1.22	677	77.53	1.29
Cranston.....	5,698	1,286	44.23	2.26	174	103.42	2.61	1,045	54.43	1.82
Cumberland.....	5,673	1,228	46.30	2.16	622	45.60	2.19	640	68.64	1.13
East Providence.....	4,336	1,033	43.23	2.31	293	82.41	1.21	592	73.24	1.36
Foster.....	1,543	212	72.78	1.37	296	32.69	3.06	151	102.30	1.96
Glocester.....	2,098	421	49.63	2.01	224	44.83	2.23	335	62.08	1.61
Johnston.....	4,999	1,159	43.13	2.32	228	110.00	1.80	745	67.10	1.49
Lincoln*.....	11,565	2,923	35.61	2.80	514	101.26	1.94	1,575	66.08	1.61
North Providence.....	1,363	191	40.92	2.44	37	106.50	1.59	113	69.18	1.45
North Smithfield*.....	2,797	537	46.89	2.13	221	62.83	1.66	322	78.17	1.26
Pawtucket.....	18,464	4,124	44.77	2.23	1,349	68.34	1.46	2,062	69.49	1.12
Situate.....	4,101	688	59.62	1.61	472	43.33	2.30	547	74.97	1.32
Smithfield†.....	2,857	611	46.76	2.14	369	45.74	2.12	421	67.86	1.47
Woonsocket.....	13,578	3,741	36.39	2.76	1,522	47.88	2.09	2,628	51.66	1.92
TOWNS, PROVIDENCE Co.....	84,249	18,264	46.67	2.14	7,282	57.77	1.73	13,440	62.68	1.59
PROVIDENCE CITY.....	100,673	23,960	42.00	2.38	10,399	48.31	2.07	17,587	57.34	1.75
PROVIDENCE COUNTY.....	184,924	42,214	43.81	2.28	17,681	52.30	1.90	31,027	59.60	1.67
Charlestown.....	1,064	173	60.92	1.64	70	75.29	1.83	151	69.80	1.42
Exeter.....	1,353	185	73.34	1.36	160	42.34	2.86	139	85.22	1.17
Hopkinton.....	2,760	604	45.69	2.19	299	63.00	1.57	382	70.41	1.42
North Kingstown.....	3,535	772	45.40	2.20	266	66.86	1.52	533	63.86	1.58
South Kingstown.....	4,240	974	43.33	2.29	373	56.84	1.77	602	70.43	1.41
Richmond.....	1,739	411	42.31	2.36	144	60.38	1.65	299	58.46	1.71
Westerly.....	5,406	945	57.23	1.73	635	42.54	2.35	608	69.68	1.11
WASHINGTON COUNTY.....	20,061	4,064	49.36	2.08	1,857	54.01	1.85	2,759	72.71	1.37
WHOLE STATE.....	238,239	58,771	44.75	2.23	24,006	53.79	1.86	41,257	62.59	1.59

\* Nine years. Organized March, 1871. † Six years. Divided May, 1874. ‡ Nine years. Divided March, 1871.

TABLE XV.

*Showing the aggregate number of Births, Marriages and Deaths, in each town and in each county in the State, during the ten years from 1870 to 1879, inclusive, with the annual average and percentage of the same events, and the aggregate and average age of all the decedents in the same towns and counties for the same period of time.*

TOWNS AND DIVISIONS OF THE STATE.	Estimated Average Population, 1870 to 1879.	BIRTHS.			MARRIAGES.			DEATHS.				
		Whole No. Births, 1870-1879.	Average to population, one in every	Per cent.	Whole No. Marriages, 1870-1879.	Average to population, one person married in every	Per cent.	Whole No. Deaths, 1870-1879.	Average to population, one in every	Per cent.	Aggregate Age of all.	Average Age of all.
Barnstable.....	1,195	156	75.96	1.31	63	94.06	1.06	142	63.45	1.19	6,123	43.12
Berkshire.....	5,820	1,738	39.54	2.94	495	71.96	1.30	904	64.37	1.35	31,334	34.66
Warren.....	4,065	721	55.32	1.41	430	45.98	2.14	656	61.00	1.64	30,977	31.98
Bristol County.....	11,010	3,018	42.00	2.38	941	60.95	1.64	1,792	64.74	1.54	57,434	33.77
Coventry.....	4,580	754	60.74	1.65	303	63.09	1.53	672	63.15	1.47	27,400	40.77
East Greenwich.....	3,120	620	40.00	2.02	305	51.15	1.96	500	63.40	1.63	30,083	40.17
West Greenwich.....	1,034	214	42.79	2.34	75	62.26	1.61	177	58.43	1.71	4,102	45.79
Warwick.....	11,014	3,108	46.49	2.15	1,053	54.11	1.46	1,461	70.49	1.36	46,569	30.15
Kent County.....	20,348	4,125	40.33	2.02	1,846	56.33	1.77	2,310	73.41	1.38	99,174	35.30
Janetown.....	498	49	99.50	1.00	22	101.90	.96	42	116.19	.86	3,104	51.62
Little Compton.....	1,156	187	61.92	1.02	60	43.77	1.19	140	62.37	1.31	7,517	53.60
Middletown.....	1,074	195	55.08	1.32	49	100.50	.91	124	66.61	1.16	5,563	45.08
New Shoreham.....	1,117	324	55.15	1.41	40	71.60	1.30	111	103.33	.96	4,151	37.30
Portsmouth.....	1,863	353	74.23	1.35	96	58.50	1.01	131	47.64	1.14	10,231	47.33
Tiverton.....	2,101	470	44.67	2.24	260	39.05	2.56	285	73.72	1.36	12,271	43.05
TOWNS, NEWPORT Co. . .	7,830	1,364	57.62	1.05	545	67.17	1.40	918	66.61	1.17	41,921	45.66
NEWPORT CITY.....	14,028	3,396	41.43	2.43	1,173	59.79	1.67	2,041	69.73	1.45	74,533	36.51
NEWPORT COUNTY.....	21,947	4,720	40.00	2.10	1,794	62.25	1.60	2,650	73.97	1.35	116,454	39.35

[illegible]

1900-1901 March 11 - 1900-1901 March 12  
 1900-1901 March 13 - 1900-1901 March 14  
 1900-1901 March 15 - 1900-1901 March 16  
 1900-1901 March 17 - 1900-1901 March 18  
 1900-1901 March 19 - 1900-1901 March 20  
 1900-1901 March 21 - 1900-1901 March 22  
 1900-1901 March 23 - 1900-1901 March 24  
 1900-1901 March 25 - 1900-1901 March 26  
 1900-1901 March 27 - 1900-1901 March 28  
 1900-1901 March 29 - 1900-1901 March 30  
 1900-1901 March 31 - 1900-1901 March 31

In the foregoing Table will be found the aggregate number of births, marriages and deaths that have occurred in each of the several towns of the State, during a period of ten years, with the annual average to the population, and average percentage of the same.

In the division of deaths, there will also be found the aggregate age of all the decedents in each of the towns, during the same period, and the average age of all.

The population of the State has been gradually, though not rapidly, increasing, in nearly all of the towns, and has therefore changed more or less in numbers in each of them, during the period of ten years. It was, therefore, desirable to ascertain, as far as possible, the average population of each of the towns during the period of time taken, for the purpose stated. Upon finding the average population of several towns, it was seen that the number was so near the population by the Census of 1875, and the number by that Census presenting an approximate mean sufficiently near for all practical purposes, it was therefore adopted as a basis for the averages and percentages.

The exceptions of towns to the whole number of ten years in the preceding Table, are: Lincoln, North Smithfield and Smithfield, which were organized as at present constituted in 1871, and therefore cover a period of nine years, and North Providence, which was divided in 1874, and covers a period of six years only.

It will be seen upon an examination of Table XV., that the proportions of the average number of each of the several classes of events to the population of the towns and sections where they occur, vary very considerably even in a long series of years, though very much less than during single years.

It will also be noticed that the larger the population, the more uniform, as a rule, will be the percentages, especially of births and deaths. The aggregation of the town populations into counties is an example.

#### BIRTHS.

In the division of births, it will be found that the average proportion of that class of events, to the population, varies from one birth in every 33.54 persons, or nearly three per cent., in Bristol, to one birth in every 99.59 persons, or about one per cent., in Jamestown.

The towns having an exceptionally high birth rate, following Bristol, are: Lincoln, one birth in every 35.61 persons; Woonsocket, one in every 36.29; North Providence, one in every 40.92 persons.

Following Jamestown, the towns having a noticeably low birth rate, are: Barrington, one birth in every 75.96 persons; Portsmouth, one in every 74.22; Exeter, one in every 73.24; and Foster, one in every 72.78 persons.

Among the larger divisions of the State, Providence city and Bristol county show the largest proportion of births to population; that is, one in every 42.00 persons, or 2.38 per cent.

The towns of Providence county show an average birth rate of one to every 46.67 persons, or 2.14 per cent.; Washington county, one in every 49.36 persons, or 2.03 per cent.; and Kent county, one in every 49.33, or 2.02 per cent.

In Newport county towns, the birth rate is one birth in every 57.62 of the population, or 1.65 per cent., while in Newport city, the proportion is one in every 41.43 persons, or 2.42 per cent. The difference of birth rates between the towns of Newport county and the city of Newport, for the term of ten years, is rather less than for the last five years.

In Newport county, the average proportion is one birth in every 46.09 persons, or 2.16 per cent., and in Providence county, one in every 43.81, or 2.28 per cent.

The annual average for the whole State is one in every 44.75 persons, or 2.23 per cent. of the population.

#### MARRIAGES.

For various obvious reasons, the marriage rates of the different towns present very much less uniformity than those of either births or deaths. The proportions vary from one person married in every 32.69 of the population, or 3.06 per cent., in Foster, to one person married in every 163.42 persons, or 0.61 per cent., in Cranston—a difference of more than five to one.

The towns having an unusually high marriage rate, following Foster, are: Tiverton, with an average annual rate of one person married in every 39.05 of the population, or 2.56 per cent.; Exeter, 2.36 per cent.; Westerly, 2.35 per cent.; and Gloucester, 2.23 per cent.

At the other extreme, following Cranston, are: Johnston, with one person married in every 110.00 persons, or .90 per cent.; Middletown, .91 per cent.; and North Providence, Jamestown and Lincoln, each falling short of one per cent. of the population in the annual average.

In the counties, the ratios of persons married, to the population, are seen to be much more uniform. The percentages are as follows: Bristol county, 1.64 per cent.; Kent county, 1.77 per cent.; Newport county, 1.60 per cent.; Providence county, 1.90 per cent.; and Washington county, 1.85 per cent.

In the whole State, for the period of ten years, the annual average is one person married to every 53.79 persons, or 1.86 per cent.



## DEATHS.

The greatest mortality, in proportion to population, is found in the town of Woonsocket, that is, an annual average of one decedent in every 51.66 of the population, or 1.92 per cent. Following Woonsocket, in the bad eminence of a high death rate, are: Cranston, with the average annual ratio of 1.82 per cent.; Providence city, 1.75 per cent.; Richmond and West Greenwich, 1.71 per cent. each. For the period of ten years, no town in the State shows an average death rate as high as two per cent.

The minimum ratio of mortality to population, is found in the town of Jamestown; with one decedent to every 116.19 persons, or 0.86 per cent. Jamestown, it will be remembered, had also the minimum percentage of births.

As a rule, it will be found that a high birth rate in any town will also be attended by a high death rate. The reason will be obvious, when it is remembered that of every 100 children born in the State of Rhode Island, during the last twenty-five years, 35 have ceased to exist at the end of five years.

Next to Jamestown, the towns showing a low rate of mortality, are: New Shoreham, one decedent in every 103.33 persons, or 0.96 per cent., and Foster, one in every 102.20 persons, or 0.98 per cent.

Newport city shows an average annual mortality of 14.5 in each one thousand, and Providence city, 17.5 in each one thousand.

In the counties, the ratios of mortality are as follows:

Bristol County.....	15.4 in each one thousand.
Kent County.....	13.8 in each one thousand.
Newport County.....	13.5 in each one thousand.
Providence County.....	16.7 in each one thousand.
Washington County.....	13.7 in each one thousand.
Whole State.....	15.9 in each one thousand.

There is a small relative loss in the State in leaving out the decedents in North Providence previous to 1874, and it cannot be said that the estimated average population is absolutely exact within a score of persons, but it will be admitted that the numbers taken are sufficiently approximate for relative comparisons, and all other practical purposes.

In order to facilitate comparisons of the average percentages to the population, of the births, marriages and deaths in the different counties of Rhode Island, and also the State, during the period of ten years from 1870 to 1879, inclusive, the following synopsis is presented:

	Births, one in every	Marriages, one person married in every	Deaths, one in every
Bristol County .....	42.09	60.95	64.74
Kent County .....	49.33	56.33	72.41
Newport County .....	46.09	62.25	73.97
Providence County .....	43.81	52.90	59.60
Washington County .....	49.36	54.01	72.71
Whole State .....	44.75	53.79	62.59

It may be of interest to contrast the births, on the basis of each 100 of the same, during the last ten years, with the number of persons married, and with the number of deaths for the same period, in each of the larger divisions of the State, and in the whole State.

In Bristol county, the aggregate of births for the period named, was 2,618; number of persons married, 1,808; number of deaths, 1,702. The proportions, therefore, stand as follows: For every 100 births there were 65.01 deaths, and 34.50 marriages, or 69.00 persons married.

In Kent county, the aggregates were: Births, 4,125; marriages, 1,806; deaths, 2,810. The proportions are as follows: For every 100 births there were 43.78 marriages, or 87.56 persons married, and 68.12 persons died.

In Newport county there were 4,750 births, 1,758 marriages, and 2,959 deaths. The ratio for every 100 births, 37.16 marriages, or 74.23 persons married, and 62.30 persons died.

In Providence county there were 42,214 births, 17,681 marriages, and 31,027 deaths. For every 100 births there were 41.88 marriages, or 83.77 persons married, and 73.50 deaths.

In Washington county there were 4,064 births, 1,857 marriages, and 2,759 deaths. For every 100 births there were 45.69 marriages, or 91.38 persons married, and 67.90 persons died.

In the whole State, for the same period, there were 58,771 births, 24,006 marriages, or 48,012 persons married, and 41,257 persons died. The proportions for the whole State are, therefore, for every 100 births there were 40.84 marriages, or 81.69 persons married, and 70.20 persons died.

The following recapitulatory summary will present the foregoing remarks more concisely and clearly:

	Persons married.	Deaths.
Bristol County.....To every 100 births there were.....	69.00	65.01
Kent County.....To every 100 births there were.....	87.56	68.12
Newport County.....To every 100 births there were.....	74.23	62.30
Providence County.....To every 100 births there were.....	83.77	73.50
Washington County.....To every 100 births there were.....	91.38	67.90
Whole State.....To every 100 births there were.....	81.69	70.20

## AVERAGE AGE.

It will be borne in mind, that the circumstance of average individual longevity, in any town or division of the State, is not dependent on the relative healthfulness of the location. The surroundings must be necessarily salubrious to promote length of life; but the character of the habitations, the home methods of living, dietetic and otherwise, the public habits and customs, the average intelligence, industry and morality of the populace, are potent factors of the length or brevity of life.

Then the circumstance of slow increase of population, owing to the departure, at an early age, of a large proportion of the population to engage in the active occupations of life in other localities, and leaving but a meagre percentage of young adults to establish families, in the child-bearing period of life, and the necessary corollary of a diminished percentage of births, of which about 35 in each 100 would be expected to have ceased to exist at the expiration of the fifth year, thus *lowering* the average age in towns having a high birth rate, and *raising* it in towns having a low birth rate.

It will, therefore, be understood that to obtain a fairly approximate knowledge of the relative healthfulness of the towns, and consequent relative longevity of the inhabitants of each, the various circumstances alluded to above must be taken into consideration.

Upon consultation of Table XV., it will be seen that the maximum average age of all the decedents during the last ten years, was in the town of Charlestown; that is, 54.33 years. The minimum average age of the whole number of decedents, for the same period, was in the town of Lincoln; that is, 22.14 years.

It will be noticed that the birth rate in Charlestown is but little more than half that of Lincoln, and a reasonable inference would be that the higher average age at death in Charlestown was owing, in great part at least, to the absence of a large proportional number of that class which is peculiarly subject to fatal diseases at an early age.

Following Charlestown, in presenting an advanced average age at the time of decease, are: Little Compton, 53.69 years; Foster, 53.14 years; Jamestown, 51.62 years; Exeter, 51.58 years.

Of the minimum average age, next to Lincoln, are: Woonsocket, 24.49 years; Providence city, 27.76 years; East Providence, 28.26 years; Pawtucket, 29.81 years.

The following summary will show the average age of decedents in the different counties and in the whole State:

Bristol County.....	Average age at death 33.77 years.
Kent County.....	Average age at death 35.29 years.
Newport County.....	Average age at death 39.35 years.
Providence County.....	Average age at death 28.37 years.
Washington County.....	Average age at death 40.52 years.
Whole State.....	Average age at death 30.68 years.

TABLE XVI.

*Showing the proportions of Births, Marriages and Deaths, to the population, in the aggregate for the whole State, in each of the last eleven years.*

YEARS.	BIRTHS.		MARRIAGES.		DEATHS.		
	Number.	To population one birth in	Number.	Of population one person married in	Number.	Of population one death in	Deaths in each 100 of the population.
1869 .....	5,345	41.4	2,289	47.5	3,382	64.2	1.56
1870 .....	5,215	41.7	2,302	46.0	3,226	67.1	1.49
1871 .....	5,678	38.2	2,336	46.5	3,344	65.0	1.54
1872 .....	6,143	35.4	2,537	42.9	4,247	51.2	1.95
1873 .....	6,022	36.1	2,630	41.3	4,403	49.4	2.08
1874 .....	6,466	39.9	2,541	50.8	4,229	61.1	1.64
1875 .....	6,508	39.7	2,495	52.0	4,317	59.8	1.67
1876 .....	6,329	40.8	2,253	57.3	4,116	62.7	1.59
1877 .....	6,235	41.4	2,282	56.6	4,450	58.0	1.72
1878 .....	6,714	38.5	2,324	55.7	4,441	58.1	1.72
1879 .....	6,350	43.6	2,396	57.8	4,472	61.9	1.60

It will be seen by the above Table, that the number of births recorded in the State during the year 1879, was less by 364 than during the preceding year, and more by 115 than in 1877.

The difference between the numbers reported in 1878 and 1879 is not greater than has occurred frequently before, and considerable fluctuation may be considered the rule.

The proportion of births to population, in the whole State, according to the Census of 1880, is one to every 42, or 2.4 per cent. The proportion of one birth in every 38.5 as given in the Report for 1878, was based upon the State Census of 1875, and, as then stated, was larger than the actual population at the time would warrant.

There is a small increase in the number of marriages as compared with the returns for 1878, but it falls considerably short of the numbers reported in each of several years previous to 1876. In 1873 the proportion of persons married, to the population, was one in every 41.3; in 1879, one in every 57.8; a difference of 0.69 per cent. It is probable the year 1880 will show a more largely increased proportion over that of 1879, than that for several previous years.

The advent and continuance of more lively industrial activities, larger demand and better compensation for labor, will, independent of increased population, doubtless contribute to swell the proportional number in the years immediately forthcoming.

The proportion of one person married, in 1879, to every 57.8 of the population of the State, by the Census of 1880, is smaller than that of any other of the preceding 20 years, and doubtless of any other year since the commencement of registration, if not of the whole period of the existence of the State.

The number of deaths reported in 1879 is also slightly larger than in 1878, and also larger than in any previous year. The proportion, however, to the population, calculated by the Census of 1880, is less than for the preceding two years, but on the same basis of population, the percentage would scarcely differ.

The proportion is one decedent in each 61.9 of the population, or 1.62 per cent.

## B I R T H S , 1 8 7 9 .

There will be found on pages 2 to 6, inclusive, in Tables I., II. and III., the general statistics in relation to births in Rhode Island, during the year 1879.

The whole number reported is 6,350, which is 364 less than in 1878, and 115 more than in 1877.

### SEX OF THE CHILDREN BORN.

Of the 6,350 children whose births were reported in 1879, there were 3,259 males and 3,091 females. This gives 105.4 males to each 100 females, or 51.32 males and 48.68 females in each 100 children.

The following recapitulatory Table shows the numbers and sex, and the proportions of each sex of the children born in Rhode Island, in each of the last twenty-six years:

TABLE XVII.

Years.	Males.	Females.	Males to each		Males.	Females.
			100 Females.			
1854.	1,081	1,008	107.8, or		51.87 and 48.13	in each 100.
1855	1,492	1,421	105.0, or		51.22 and 48.78	in each 100.
1856	1,479	1,407	105.1, or		51.25 and 48.75	in each 100.
1857	2,057	1,948	105.6, or		51.36 and 48.64	in each 100.
1858	2,300	2,053	107.2, or		51.73 and 48.27	in each 100.
1859	2,309	2,097	105.3, or		51.30 and 48.70	in each 100.
1860	2,363	2,212	102.3, or		50.57 and 49.43	in each 100.
1861	2,531	2,291	110.5, or		52.49 and 47.51	in each 100.
1862	2,152	1,907	109.4, or		52.25 and 47.75	in each 100.
1863	1,892	1,288	105.8, or		51.41 and 48.59	in each 100.
1864	1,949	1,942	100.3, or		50.09 and 49.91	in each 100.
1865	2,096	1,857	112.9, or		53.02 and 46.98	in each 100.
1866	2,546	2,356	108.0, or		51.94 and 48.06	in each 100.
1867	2,665	2,464	107.0, or		51.87 and 48.13	in each 100.
1868	2,745	2,627	104.5, or		51.10 and 48.90	in each 100.
1869	2,685	2,500	104.9, or		51.19 and 48.81	in each 100.
1870	2,679	2,536	105.6, or		51.37 and 48.63	in each 100.
1871	2,878	2,800	102.8, or		50.69 and 49.31	in each 100.
1872	3,065	3,058	100.9, or		50.22 and 49.78	in each 100.
1873	3,135	2,887	108.6, or		52.06 and 47.94	in each 100.
1874	3,311	3,155	104.9, or		51.21 and 48.79	in each 100.
1875	3,362	3,146	106.9, or		51.66 and 48.34	in each 100.
1876	3,291	3,088	108.3, or		52.00 and 48.00	in each 100.
1877	3,163	3,072	103.0, or		50.73 and 49.27	in each 100.
1878	3,402	3,312	102.7, or		50.67 and 49.33	in each 100.
1879	3,259	3,091	105.4, or		51.32 and 48.68	in each 100.

The number of male births in 1879 was 143 less than in 1878, the number of female births, 121 less. The whole number of births reported in 1878 was largely in excess of any previous year, but it must be admitted that with the ordinary increase of population, the number of births reported in 1879 is less than might reasonably be expected.

#### PROPORTION OF THE SEXES.

In Table II., on the fourth page, will be found the number of births in 1879, reported from the different divisions of the State, with the number of each sex respectively.

A wide difference in the proportion of the sexes is found one year with another, not only between the different divisions, but also in the same division.

The following Table will present the number and proportion in each division in 1879:

TABLE XVIII.

BIRTHS, 1879.	Bristol County.	Kent County.	Newport County, Towns.	Providence County, Towns.	Washington County.	Newport City.	Total.	Providence City.	Whole State.
Males.....	133	211	75	1,164	329	151	1,963	1,397	3,259
Females.....	107	221	66	1,104	216	152	1,866	1,235	3,091
Total.....	240	432	141	2,268	445	303	3,829	2,522	6,350
Males to each 100 Females..	124.3	95.5	113.6	105.4	106.3	99.3	105.1	105.7	105.4

Taking a large population there will, in every year, be a larger proportion of male children born than of females. But in smaller populations, the proportions will curiously vary.

By the above Table it will be seen that, while in Bristol county the proportion was 124.3 males to each 100 females; in Kent county it was reversed, and stands only 95.5 males to each 100 females.

By reference to Table XIX., it will be seen that Bristol county has reported a large excess of male births for 15 out of 17 years registration, running up in 1876 to 142.1 males to each 100 females.

In Kent county, the difference has not been so marked, but the excess was largest of male children in 1878; that is, 120.6 males to each 100 females.

In Newport city, the proportions are nearly equal, while in the towns of Newport county the males predominate, 113.6 males to each

100 females. In 1878, the births of female children in Newport city exceeded those of male children quite largely, and there was also an excess of female births, taking the whole county together.

In the towns of Providence county and in Providence city, the excess of male children is about equal; that is, about 105.6 males to each 100 females.

In Washington county, the male births again predominate, 106.3 males to 100 females. In 1878, Washington county reported the largest proportional number of female births of any county in the State for a period of sixteen years; that is, 126.8 females to each 100 males.

In the whole State, the proportion of the sexes is 105.4 males to each 100 females.

#### PROPORTION OF THE SEXES.

##### *Contrast of the city of Providence with the rest of the State.*

The possible influence of modes of living in determining the sex of children has been frequently mooted. In order to illustrate the difference, if any exist, between city life, and village and country life, as found in Rhode Island, a comparison of the statistics of births in the city of Providence, with those reported from the rest of the State, will be presented.

These comparisons would hardly be a fair test of the influence of city life, as they might be found in cities less favored than the city of Providence, in regard to location, and other circumstances and conditions favorable to health, and a purely country life.

There are several large and many small villages in the State, and parts of the city of Newport, where may be found existing all the conditions contributing to either temporary physical exhaustion, or final mental and physical degeneration, almost, if not quite as largely as in the city of Providence.

The whole number of births in the city of Providence during the year 1879 was 2,522, of which 1,297 were males, and 1,225 were females. The proportion of males to females would therefore be as follows: 105.7 males to each 100 females, or 51.43 males and 48.57 females in each 100 children born.

In the rest of the State, during the same year, the whole number of children born was 3,828, of which 1,972 were males, and 1,856 were females, or 51.25 males and 48.75 females in each 100 births.

The following shows the proportion of the sexes of the children born in Providence, and in the rest of the State, during the years 1878 and 1879, and also in the twenty-five years from 1854 to 1878, inclusive:



## 1878.

	Males to each				
	Males.	Females.	100 Females.	Males.	Females.
Providence City .....	1,335	1,250	106.8, or	51.64	and 48.36 in each 100.
Rest of the State .....	2,067	2,062	100.2, or	50.06	and 49.94 in each 100.

## 1879.

	Males to each				
	Males.	Females.	100 Females.	Males.	Females.
Providence City .....	1,297	1,235	105.7, or	51.43	and 48.57 in each 100.
Rest of the State .....	1,962	1,866	105.1, or	51.25	and 48.75 in each 100.

## TWENTY-FIVE YEARS, 1854 TO 1878, INCLUSIVE.

	Males to each				
	Males.	Females.	100 Females.	Males.	Females.
Providence City .....	24,051	22,774	105.6, or	51.36	and 48.64 in each 100.
Rest of the State .....	38,297	35,728	107.2, or	51.74	and 48.26 in each 100.

It will be seen by the above comparison, that during the last two years the births of male children in the city of Providence have exceeded those of female children. This, also, is shown to be no exception to the general rule, by the summary for twenty-five years.

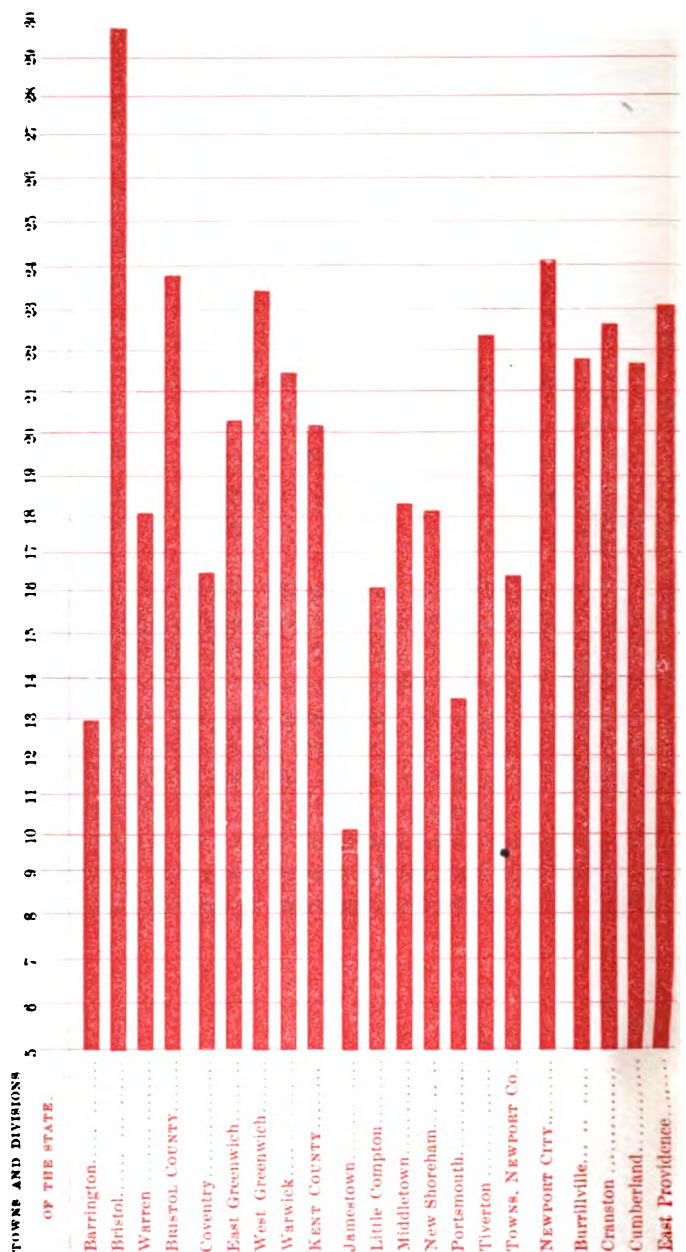
It must be admitted that the conditions of city or country life, strictly each by itself, have little influence in the causation of sex, or that in Rhode Island, at least, the habits, customs, and everything pertaining to manner of living, are not very dissimilar.

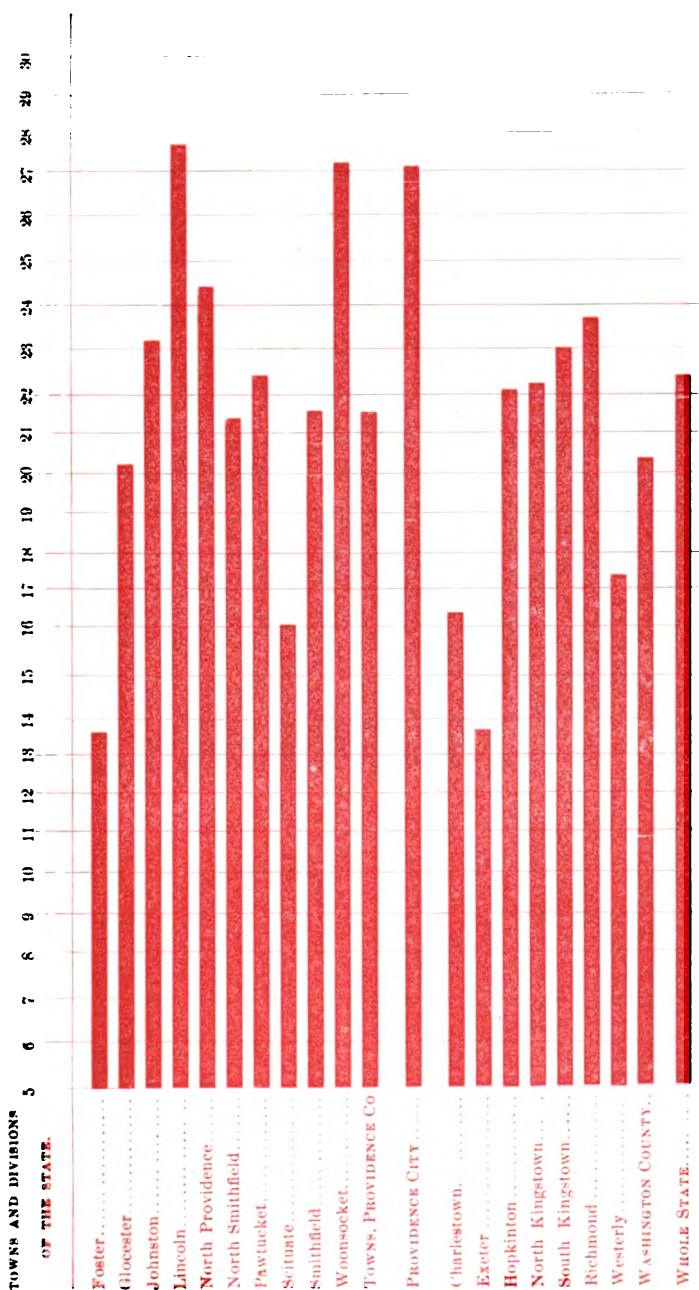
The following Table, continued from the last report, shows the relative proportions of the sexes, in each of the last seventeen years, in each of the larger divisions of the State, and in the whole State:



# BIRTH RATE.

Diagram showing the annual average of births in each town in the State, during the period of ten years, from 1870 to 1879, inclusive.





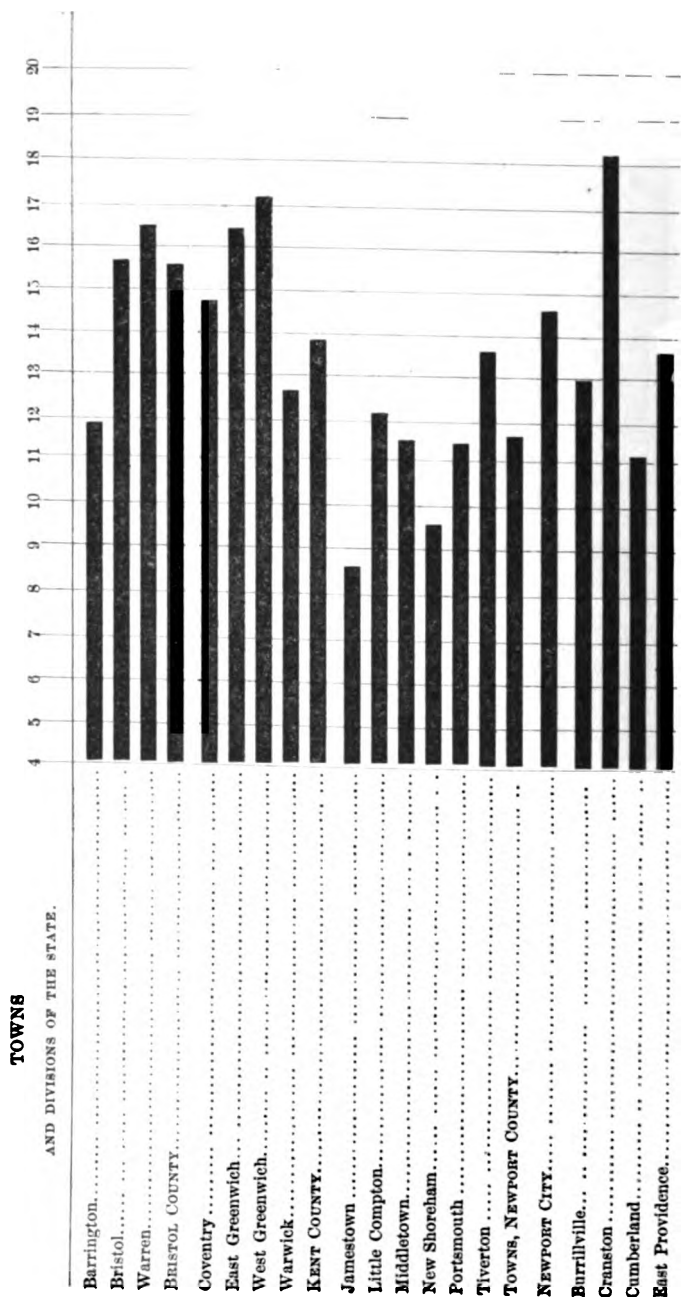
The figures at the top of the perpendicular lines indicate, in whole numbers, the average of births each year in every 1000 persons. The spaces are fractional parts of one. For instance, the heavy horizontal line against Barrington reaches nearly to perpendicular line 13. It shows the birth rate of Barrington to be about 13 in each 1000.





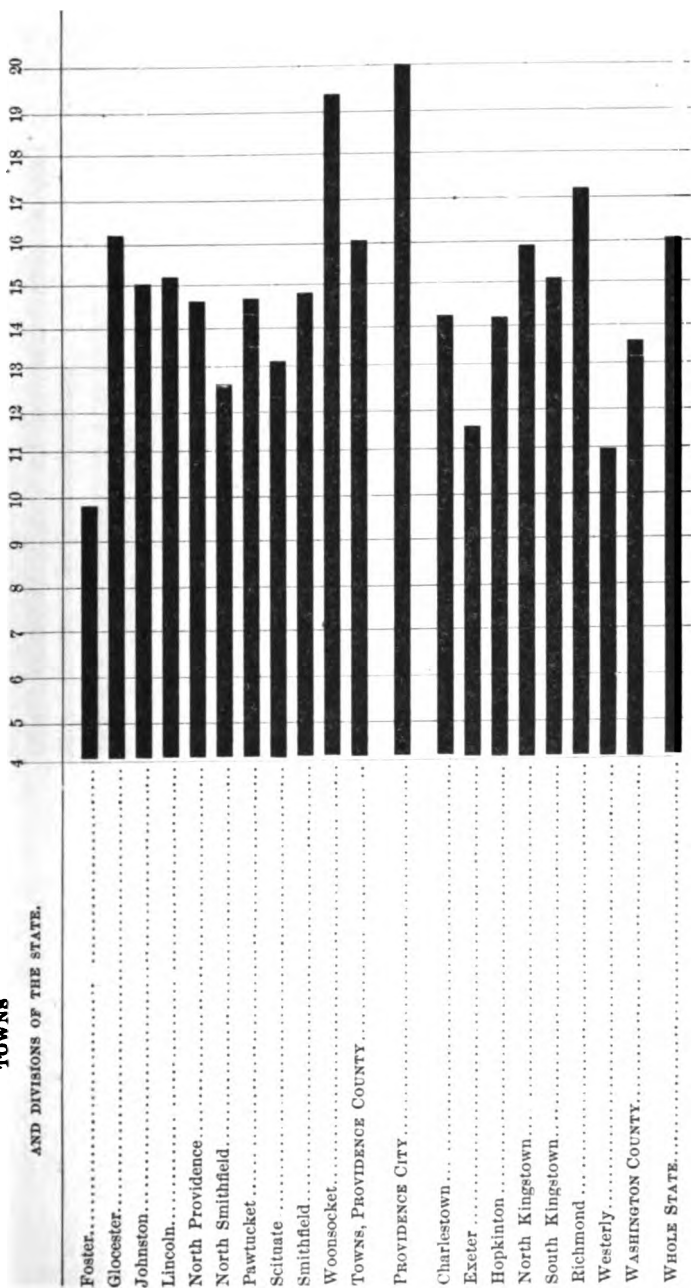
# DEATH RATE.

Diagram showing the annual average of deaths in each 1000 of the population in each town in the State, during the period of ten years, from 1870 to 1879, inclusive.



# TOWNS

AND DIVISIONS OF THE STATE.



The figures at the top of the perpendicular lines indicate, in whole numbers, the average of deaths each year in every 1000 persons. The spaces are fractional parts of one. For instance, the heavy horizontal line against Barrington reaches nearly to perpendicular line 12. It shows the death rate of Barrington to be 11 9-10 per 1000.





TABLE XIX.

NUMBER OF MALES TO EACH 100 FEMALES.

BIRTHS.	Bristol County.	Kent County.	Newport County.	Providence County, Towns.	Providence City.	Washington County.	Whole State.
1863.....	120.0	98.4	97.0	101.8	111.4	108.7	105.8
1864.....	106.8	87.3	90.6	107.4	97.3	108.4	100.3
1865.....	119.3	118.2	106.8	118.9	113.8	88.1	112.9
1866.....	109.4	118.1	103.4	104.9	108.4	124.0	108.0
1867.....	115.5	98.3	117.8	106.3	104.5	120.4	107.7
1868.....	117.4	88.7	100.2	101.6	102.4	136.5	104.5
1869.....	115.7	116.7	102.7	98.0	107.5	120.6	104.9
1870.....	126.4	111.6	100.0	105.1	104.9	90.5	105.6
1871.....	131.8	97.9	132.5	100.8	95.2	113.3	102.8
1872.....	109.2	92.8	109.1	108.5	95.7	110.6	100.9
1873.....	129.2	113.0	117.9	104.5	109.0	104.7	108.6
1874.....	98.7	111.9	101.3	110.4	102.9	94.0	104.9
1875.....	95.2	108.1	97.7	104.3	109.1	134.3	106.9
1876.....	142.1	104.4	108.5	108.0	106.8	108.7	108.3
1877.....	133.7	102.4	98.5	100.3	104.9	95.3	103.0
1878.....	120.5	120.6	94.8	101.5	106.8	78.8	102.7
1879.....	124.3	95.5	103.6	105.4	105.7	106.3	105.4

An examination of the preceding Table will show, that while there has been an excess of births of male children, taking the whole State, in each of the last seventeen years, the excess has not prevailed without exceptions in each of the several larger divisions.

In Bristol county, during that time, the exceptions have occurred but twice, and then, as will be seen in the Table, the excess of female births was not large in degree. In Kent county, the births of female children have exceeded those of the male sex in seven of the seventeen years; in Newport county, during five; in Providence county, towns, during one only; in Providence city, during three, and in Washington county, during five of the seventeen years. The difference in Washington county, in 1878, 78.8 males to each 100 females, was larger than any recorded in any other division during the whole period.

As showing the changes that occur from year to year, reference may be made to the proportion of the sexes born in Washington county

during the year 1868, 136.5 males to each 100 females, or nearly double the proportion of males born in the same county, in 1878.

Attention is also called to the remarkable record of Bristol county during each of the last four years, in which the yearly average of male children born has been 131.4 to each 100 females.

During the period of seventeen years, the extremes of difference in the proportions of the sexes born, have been greatest in Washington county, and least in Providence city, and next least, and closely following, Providence county, towns.

#### BIRTHS: SEX AND SEASON.

In Table II., on page 4, will be found the number of births, as they occurred during the year 1879, arranged by the several months, and by the sexes. From it we ascertain the number of each of the sexes born during each quarter of the year, with their relative proportions, and also the aggregates and proportions of the same for the whole State.

The following Table will present a summary of the quarterly periods, number of births and proportion of the sexes, for the same:

	Males to each					
	Males.	Females.	100 Females.	Males.	Females.	
1. January—March.....	749	716	104.6, or.....	51.13	and 49.87	in each 100.
2. April—June.....	794	762	104.2, or.....	51.00	and 49.00	in each 100.
3. July—September.....	833	820	101.6, or.....	50.33	and 49.67	in each 100.
4. October—December.....	883	793	111.4, or.....	52.68	and 47.32	in each 100.
Year, 1879.....	3,259	3,091	105.4, or.....	51.34	and 48.66	in each 100.

We continue the following Table from the last report, which shows the number of male children born to each 100 female children, in each quarter of each of the last fourteen years:

TABLE XX.

YEARS.	1879.	1878.	1877.	1876.	1875.	1874.	1873.	1872.	1871.	1870.	1869.	1868.	1867.	1866.
First Quarter.....	104.6	106.6	107.9	105.7	97.7	100.4	98.3	98.8	112.4	111.6	107.3	102.4	105.5	108.7
Second Quarter.....	104.2	98.9	103.1	109.2	113.8	108.2	105.9	100.5	95.0	100.8	105.1	118.8	108.9	102.9
Third Quarter.....	101.6	103.8	97.6	108.0	108.2	105.1	109.9	101.6	99.3	101.0	101.9	103.1	110.4	113.8
Fourth Quarter.....	111.4	102.0	104.2	110.4	107.9	105.9	110.4	103.4	105.0	109.2	105.6	96.2	106.5	106.6
Whole Year.....	105.4	102.7	103.0	108.3	106.9	104.9	108.6	100.9	102.8	105.6	104.9	104.5	107.7	108.0

It has been previously observed that the number of male children born in the whole State, in each and every year, has been invariably larger than that of female children, but the difference in the proportions has, as might be expected, varied somewhat from year to year.

The excess of male births during the year 1879, was larger by nearly three per cent., than during the year 1878. The excess occurred very largely in the fourth quarter, which, compared with the same quarter, in 1878, is found to have been more than nine per cent. greater.

For the purpose of illustrating more fully, the possible influence of season upon the development or causation of sex of the children born in Rhode Island, the following Table has been prepared, which shows the number and sex of the children born in the State, in each quarter of the year, in the aggregate for twenty years, from 1860 to 1879, inclusive; and also the proportion of the sexes in each quarter:

Males to each					
	Males.	Females.	100 Females.	Males.	Females.
1. January—March.....	12,912.....	12,202.....	105.8, or.....	51.41 and 48.59	in each 100 births.
2. April—June .....	13,006.....	12,226.....	106.4, or.....	51.55 and 48.45	in each 100 births.
3. July—September.....	14,188.....	13,611.....	104.3, or.....	50.85 and 49.15	in each 100 births.
4. October—December.....	14,971.....	14,072.....	106.4, or.....	51.55 and 48.45	in each 100 births.
<hr/>					
Whole No. 20 years.....	55,077.....	52,151.....	105.6, or.....	51.37 and 48.63	in each 100 births.

Judging from the results, as shown in the above summary for twenty years, it does not appear that the conditions of the different seasons have very decided and evident influences in the causation of sex.

#### BIRTHS AND SEASON.

The influence of season in regard to the whole number of children born, may also claim attention as a question of considerable importance.

The following Table shows the total number of children born in the State of Rhode Island, (according to the returns,) in each quarter of each of the last ten years; and also the aggregate number and the percentage of the aggregate in each quarter for twenty-seven years, from 1853 to 1879, inclusive:

TABLE XXI.

QUARTERS.	1879.	1878.	1877.	1876.	1875.	1874.	1873.	1872.	1871.	1870.	1858 to 1879.	
											Number.	Per cent.
January—March...	1,465	1,622	1,399	1,524	1,546	1,485	1,382	1,348	1,332	1,183	30,402	23.71
April—June .....	1,556	1,565	1,406	1,496	1,608	1,555	1,399	1,464	1,299	1,243	30,115	23.50
July—September ..	1,653	1,731	1,674	1,668	1,668	1,662	1,583	1,663	1,475	1,327	33,599	26.21
October—December	1,676	1,796	1,756	1,641	1,686	1,744	1,658	1,666	1,572	1,462	34,079	26.58
Whole Year.....	6,350	6,714	6,235	6,329	6,508	6,466	6,022	6,143	5,678	5,215	128,195	100.00

An examination of the above Table will show that the year 1879 presented no exception, according to the returns, to the general rule, for the whole period of registration, of the occurrence of the smaller number of births during the first half of the year. It will also be noticed that during the last ten years, the numbers have increased regularly from the first to the last quarter, with but few exceptions, and also that the totals of each half year, for a period of twenty-seven years, show the average proportions to be 47.2 in the first half, and 52.8 in the last half, of the year, in each 100 children born.

Do the statistics, as presented, warrant the conclusion that there are more births during the last, than during the first half, of the year?

It is a question involving the accuracy of the returns. If the returns are correct, then unquestionably the statistics shown above justify such a conclusion, and the fact is established.

In regard to the question of correct returns, it may be stated that, in cities where the collection of returns of births is made semi-annually, the *difference* in the number for each half year, respectively, is *less* than in cities and towns where the collection is made annually. In the report for the year 1878, the reasons were accounted for in part as follows:

“The collector of returns, canvassing a town in the month of January of a year succeeding that in which the births occurred, will fail to find many families in which there have been births during the first months of the previous year, for the reason that they have removed to other towns. Then, again, persons, some parents even, from forgetfulness or heedlessness, and especially when a child dies during the first weeks or months of infancy, will fail to inform the collector when called upon. But for the later months of the year, in Rhode Island, the removal of families is very much less frequent, and the memory of heedless persons called upon in the January following has not so long a period of time to cover.

"It is, however, quite possible that the circumstances of season, the modes of living, the temperature and other meteorological conditions of the colder months, may have some influence in the aptness to human reproduction."

The percentages of the different quarters of the year 1879, were as follows: First quarter, 23.07; Second quarter, 24.54; Third quarter, 26.04; Fourth quarter, 26.35.

#### PARENTAGE.

By reference to Table I., page 2, in the division of births, there will be found the parentage of the children born in Rhode Island during the year 1879. It will be seen that of the whole number—6,350—there were 2,767 of American parentage, 2,573 foreign, and 1,010 of mixed parentage.

The following Table will show the parentage of the children born in the State, and the variations of the same from year to year, in each of the last four years, and also the number and variations occurring in four periods of five years each, from 1858 to 1877, inclusive:

TABLE XXII.

PARENTAGE.	1879.	1878.	1877.	1876.	5 years. 1873 to 1877.	5 years. 1868 to 1872.	5 years. 1863 to 1867.	5 years. 1858 to 1862.
American.....	2,767	2,887	2,665	2,585	13,431	12,214	9,712	10,609
Foreign.....	2,573	2,848	2,642	2,873	13,990	12,366	9,968	9,697
Amer. father and For. mother.....	442	468	416	354	11,782	1,353	876	814
For. father and Amer. mother.....	568	516	512	517	2,357	1,720	941	755
Parentage not stated.....							70	223
Total.....	6,350	6,714	6,285	6,329	31,560	27,653	21,567	22,068

The changes that have occurred in the proportions of the births in the different classes, during the period of twenty-two years, may be shown in a different, and perhaps clearer manner, by the following Table of *percentages*:

TABLE XXIII.

PARENTAGE.	1879.	1878.	1877.	1876.	5 years. 1873 to 1877.	5 years. 1868 to 1872.	5 years. 1863 to 1867.	5 years. 1858 to 1862.
American.....	43.57	43.00	42.74	40.84	42.55	44.17	45.18	48.50
Foreign.....	40.53	42.82	42.38	45.40	44.35	44.72	46.37	44.83
American father and For. mother....	6.96	6.35	6.67	5.59	5.84	4.89	4.07	3.72
Foreign father and Amer. mother....	8.94	7.83	8.21	8.17	7.26	6.22	4.38	3.45
Total.....	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

The number of births occurring from year to year, among the different classes of the population, is in conformity with the general rule of variation, though perhaps somewhat less limited in extent.

By the preceding Tables, it will be seen that, the number and percentage of children of parents of purely American birth, had been gradually lessening, in proportion to the whole number of births, with a single exception, for a period of at least twenty years, until, in the year 1876, it was less than 41 per cent. In the following year there was a turn in the tide, and since then the births of children of purely American parentage, have gradually, though slightly, increased.

During the same years, until 1877, the children of purely foreign parentage, with one exception, were in excess.

At the same time, during a period of twenty-two years, from 1858, to 1879, inclusive, the births of children in the class of mixed parentage,—that is, of American father and foreign mother, and *vice versa*,—had increased from 7.17 per cent., to 15.90 per cent.

These facts are in evidence that the sentiment of class prejudice has been gradually lessening in the communities, a topic which will be further considered when the events under the title of Marriages are taken up for report.

In Table XXII., it will be seen that there were more births of children of foreign father and American mother, not only in the year 1879, but in every year since 1862, than there were of American father and foreign mother.

In the statistics of Marriage it will be seen that more foreign grooms took American brides than *vice versa*.

Table XXIII. shows a larger percentage of children born in 1877, 1878 and 1879, of purely American, than purely foreign parentage. But this is true *only* in the proportion to the *whole number of births* during these years, and not in the proportion of the births to the *whole population*. There being a larger American than foreign popu-

lation, it might reasonably be supposed, that not only would there be a larger number of births of children of American parentage, but that the percentage would be in a ratio equal to the American population. Such supposition is, however, not borne out by the facts as presented in the statistics.

Unfortunately, at the time of making up this report, the returns of the Census of 1880, in regard to class population in Rhode Island, had not been officially declared, and therefore no calculation of percentages of births according to the relative number of class population, could correctly be made.

In order to contrast the number and percentages of the children born in the different classes, as seen in the two preceding Tables, with the percentages according to the population, for the same number of years, with the exception of 1879, for reasons stated above, the following Table, introduced in the report for 1878, is again presented:

TABLE XXIV.

CHILDREN WITH	1878.	1877.	1876.	1875.	1874.	1873.	5 years. 1868 to 1872.	5 years. 1863 to 1867.	5 years. 1858 to 1862.
American fathers.....	49.89	49.41	46.43	47.88	47.14	50.30	49.06	49.25	52.22
Foreign fathers.....	50.11	50.59	53.57	52.12	52.86	49.70	50.94	50.75	47.78
American mothers.....	50.68	50.95	49.01	49.37	49.07	51.86	50.39	49.56	51.95
Foreign mothers.....	49.32	49.05	50.99	50.63	50.93	48.14	49.61	50.44	48.06

An examination of Table XXIV. will show that the percentage of children born of American fathers—by the Census rule of classification of population—has been almost uniformly less than the proportion of the American to the whole population, and the percentage of children born of foreign fathers, has been equally uniform in being larger than the proportion of that class to the whole population.

#### COLORED CHILDREN.

There are some special questions connected with the birth rate and the death rate of the colored people in Rhode Island, and therefore the statistics of that people, though included in the general statistics, have been separately considered.

The number of births of colored children, according to the returns of 1879, is 159. This is smaller by 13, than the number reported in 1878.



The numbers and proportions in regard to sex, were as follows, viz.: Males, 84; Females, 75; or 52.10 males and 47.90 females in each 100 births; or 113.5 males to each 100 females.

The towns from which colored births were reported, and the number in each, are as follows:

Bristol.....	1	Burrillville..	1	North Kingstown ...	4
Warren.....	1	Cranston.....	4	South Kingstown.....	6
East Greenwich.....	4	East Providence.....	4	Richmond.....	1
Warwick.....	3	Johnston ..	3	Westerly....	1
Portsmouth.....	1	Pawtucket.....	3		
Newport City.....	13	Providence City .....	104		
Total.....			159		

#### NUMBER OF THE CHILD OF THE MOTHER.

In the Report of the State Board of Health for 1878, the following remarks will be found under the above heading: "The following Table will be found interesting, as showing the capacity of the females of Rhode Island for long periods and frequent repetition of child-bearing. The general condition of the public health, and the physical vigor and power of endurance of any class of people, may be determined in a large measure by such statistics. In Rhode Island, however, they would be less reliable than in sections of this or other countries, where the disposition to avoid a repetition of child-bearing, or of avoiding it entirely, was less universal."

The Table shows the number of the child of the mother; that is, how many of the children born were reported as the first, second, third, &c., of their respective mothers. The statistics on this subject begin with the year 1857, and the following Table includes the children reported in 1878, and in 1879, and also the total for twenty-two years, 1857 to 1878, inclusive:

TABLE XXV.

NUMBER OF THE CHILD OF THE MOTHER.	1879.	1878.	23 years. 1857 to 1878.
First.....	1,435	1,463	27,268
Second.....	1,194	1,360	22,487
Third.....	1,008	1,069	17,425
Fourth.....	809	826	13,028
Fifth.....	593	599	9,685
Sixth.....	437	499	6,999
Seventh.....	309	319	4,887
Eighth.....	231	238	3,316
Ninth.....	138	136	2,200
Tenth.....	77	96	1,442
Eleventh.....	53	54	806
Twelfth.....	37	38	498
Thirteenth.....	29	18	242
Fourteenth.....	10	8	122
Fifteenth.....	5	7	70
Sixteenth.....	4	2	33
Seventeenth.....	1	1	25
Eighteenth.....	0	1	7
Nineteenth.....	0	0	5
Twentieth.....	0	0	3
Twenty-first.....	0	1	3
Twenty-second.....	0	0	2
Total.....	6,350	6,714	110,653

In the year 1879, of the whole number of births (6,350) reported in Rhode Island, 1,435, or 22.59 per cent., were the first children of the mother. The proportion is larger than that in 1878, but considerably smaller than the average of the last twelve years, which is about 25 per cent. The proportion of the second children of the mother, 18.80 per cent., is smaller than that of 1878, and also smaller than the general average of the last twelve years.

The above Table does not include all the births reported during the period of twenty-three years, for the reason that the returns seldom give the number of child of the mother, of the entire number of children born in any one year.

The following Table shows what percentage of the children born in each of the last six years, were the first, second, &c., children of the

mothers, and also the average percentage of the same for a period of ten years, from 1868 to 1877, inclusive:

TABLE XXVI.

NUMBER OF THE CHILD.	1879.	1878.	1877.	1876.	1875.	1874.	10 years. From 1868 to 1877.
First.....	22.59	21.77	22.98	24.11	24.37	25.54	25.21
Second.....	18.80	20.26	20.98	20.63	20.80	21.09	20.65
Third.....	15.87	18.90	16.22	16.04	14.93	15.53	15.49
Fourth.....	12.74	12.32	12.09	12.00	11.78	10.97	11.37
Fifth.....	9.33	8.77	9.07	8.42	8.81	8.56	8.38
First to Fifth.....	79.33	82.02	81.29	81.20	80.69	81.69	81.10
Sixth and over.....	20.67	17.96	18.71	18.80	19.31	18.31	18.90
Total.....	100.00	100.00	100.00	100.00	100.00	100.00	100.00

It will be observed that the statistics show that of all the children born in Rhode Island during the last twelve years, about one-quarter were the first child of the mother; about one-fifth, the second; about one-seventh, the third, and about one-ninth, the fourth child of the mother.

The number of mothers in Rhode Island bearing ten children or more, is very small, and of that number by far the larger part is of foreign birth.

## PLURALITY BIRTHS.

The statistics of plurality births in Rhode Island for 1879, may be found on page 6, Table III. It will be seen that there were sixty-four cases of plurality births during the year; all of twins. The number of children was 128, of which 70 were males, and 58 were females.

Of the 64 cases, 23 were in Providence city; 20 in Providence county towns; 4 in Newport county; 7 in Kent county; 3 in Bristol county, and 7 in Washington county.

The parentage of the same was as follows: Of the cases, 31 were purely American; 12, Irish; 3, English; 2, Scotch; 3, British American; 1, Swedish; 2, Portuguese, and 10 of mixed parentage, of which 3 were of American fathers, and 4 of American mothers.

In regard to season, they occurred as follows:

January.....	9	April.....	4	July.....	6	October.....	3
February.....	2	May.....	5	August.....	9	November.....	3
March.....	3	June.....	5	September.....	6	December.....	9
	<u>14</u>		<u>14</u>		<u>21</u>		<u>15</u>

The general statistics of births reported in Rhode Island during a period of twenty-seven years, that is, from 1853 to 1879, inclusive, are as follows:

126,913 cases of single births.....	giving 126,913 children.
1,363 cases of twin births.....	giving 2,726 children.
18 cases of triple births.....	giving 54 children.
<hr/>	
128,294 cases of child-birth.....	giving 129,693 children.

Of the whole number of cases of child-birth (128,294) during the twenty-seven years, one in 94.1 produced twins, and one in 7,127 produced triplets.

Of the whole number of children born during the same period, (129,693,) ascertained from the reports, one in every 47 was a twin, and one in every 2,376 was a triplet.

Of the 1,381 cases of plurality births which have occurred in the State during the last twenty-seven years, there were 591 cases in which both parents were Americans; 667 cases in which both parents were foreign; 115 cases in which the parentage was mixed; that is, one American and one foreign parent; and 8 in which the parentage was not stated.

The whole number of children born in plurality cases during the twenty-seven years was 2,780; of whom 1,398 were males, and 1,378 were females; the sex of the remaining four was not given.

#### STILL-BORN CHILDREN.

The statistics in relation to still-born children, as stated in previous reports, are obtained from the returns of deaths, but are not numbered with, or in any way included in, the statistics of this or previous reports. For the reason that they occupy a somewhat anomalous position in the statistics of life and death, they are given a separate consideration.

The whole number of still-born children reported in Rhode Island for the year 1879 was 216; this is 32 less than for the year 1878, and 26 less than for the year 1877.

The following are the numbers reported from the different larger divisions of the State:

Bristol County.....	7	Providence County, Towns.....	45
Kent County.....	9	Providence City.....	121
Newport County, Towns.....	4	Washington County.....	19
Newport City.....	11	Whole State .....	216

There were ten towns from which no report of still-born children was received; one more than in 1878, and four less than in 1877.

*Sex.*—Of the 216 still-born children, 124 were males and 92 females.

*Parentage.*—Of the 216 births of this class, the parentage was divided as follows:

American parents.....	118
Foreign parents.....	98
Whole number.....	216

*Color.*—The divisions of the still-born children in respect to color were as follows:

White.....	204	Black.....	12
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The number of colored still-born children was the same as in 1878, and three less than in 1877.

Of the white still-born children there were 32 less than in 1878, and 23 less than in 1877.

*Season.*—The number of still-born children reported in each of the several months of 1879 was as follows:

January.....	19	May.....	19	September..	21
February.....	16	June.....	18	October.....	20
March.....	14	July.....	25	November.....	15
April.....	10	August.....	17	December.....	23
Total.....	216				

#### SUMMARY OF STILL-BORN.

The following Table shows the number and sex of the still-born children, whose births were reported in Rhode Island, during the period from June 1, 1852, to December 31, 1878, and for each of the last five years:

TABLE XXVII.

SEX.	1879.	1878.	1877.	1876.	1875.	June 1, 1852, to Dec. 31, 1878.	Total.
Males.....	124	149	147	181	133	2,843	2,967
Females.....	92	99	95	92	113	1,990	1,969
Sex not stated .....						52	52
Total.....	216	248	242	273	246	4,785	5,001

It will be seen that the whole number of still-births reported in the State since June 1, 1852, is 5,001. Of the sex of this number, there were 2,967 males, 1,982 females, and of 52 the sex was not given. The ratio of occurrence, in regard to sex, would therefore be as follows: In each 100 children there were 60 males, and 40 females; or for every 100 females, there were 150 males.

It will be seen that the proportion for the year 1879 varies considerably from the average of a period of more than twenty-seven years. The proportion standing 135 males to each 100 females. Why there should be constantly, in every year, so large an excess of males among the still-born, is a question of difficult solution.

*Season of Still-births.*—The following summary will show the number of still-births that have been reported in Rhode Island, during a period of twenty-seven years, from 1853 to 1879, inclusive, with the months and quarters in which they occurred:

STILL-BORN—TWENTY-SEVEN YEARS—1853-1879. SEASON.							
January.....	449	April.....	377	July.....	431	October... ..	384
February.....	415	May.....	390	August.....	450	November.....	417
March.....	397	June.....	368	September.....	431	December... ..	471
1st Quarter.....	1,261	2d Quarter... ..	1,185	3d Quarter.....	1,303	4th Quarter.....	1,373

First six months, 2,396; second six months, 2,574; total, 4,970.

#### PARENTAGE OF STILL-BORN.

The question of the parentage of the still-born has been heretofore considered as one of some importance, or at least of some interest. It is chiefly important in regard to the changes that have occurred in the proportional number of the still-born of American and foreign origin, respectively, from year to year. Previous to 1859, the parentage of the still-born was not reported.

During the thirteen years from 1859 to 1871, inclusive, the whole number of still-births reported was 2,263, of which the parentage was as follows: American, 927; foreign, 1,334; unknown, 2.

The proportions were, therefore, 41.0 American and 59.0 foreign in each 100.

To show the changes that have occurred, from year to year, in the percentages of parentage of the still-born, in contrast with the percentages of the same nativities to the whole number of births, the following resumé is presented:

Years.	Of Whole No. Births.		Of Whole No. Still-born.	
	American.	Foreign.	American.	Foreign.
1871.....	49.36	and 50.64 in each 100.....	41.00	and 59.00 in each 100.
1872.....	47.59	and 52.41 in each 100.....	41.25	and 58.75 in each 100.
1873.....	50.30	and 49.70 in each 100.....	59.21	and 40.79 in each 100.
1874.....	47.14	and 52.86 in each 100.....	50.00	and 50.00 in each 100.
1875.....	47.88	and 52.12 in each 100.....	49.19	and 50.81 in each 100.
1876.....	46.43	and 53.57 in each 100.....	45.76	and 54.24 in each 100.
1877.....	49.41	and 51.59 in each 100.....	53.81	and 46.69 in each 100.
1878.....	49.35	and 50.65 in each 100.....	55.65	and 44.35 in each 100.
1879.....	50.53	and 49.47 in each 100.....	54.63	and 45.37 in each 100.
15 years.				
1858-1872.....	50.54	and 49.46 in each 100.....	41.25	and 58.75 in each 100.
7 years.				
1873-1879.....	48.57	and 51.43 in each 100.....	52.55	and 47.45 in each 100.

## MARRIAGES, 1879.

The number of marriages reported in Rhode Island during the year 1879 was 2,396. This number was 72 more than in 1878, and 114 more than in 1877.

The general statistics of marriages in 1879, in relation to season and number, in the different divisions of the State, may be found in Table IV., on the seventh page.

### SEASON.

The number and percentage of marriages in Rhode Island, in each quarter of the year 1879, may be found in the following Table, together with the aggregate number and percentage in each quarter, for the twenty-five years previous, viz., from 1853 to 1878, inclusive:

TABLE XXVIII.

YEARS.		First Quarter.	Second Quarter.	Third Quarter.	Fourth Quarter.	Whole Year.
1879.....	Number.....	521	611	554	710	2,396
	Percentage.....	21.74	25.50	23.13	29.63	100.00
26 Years. 1853-1878 .....	Number.....	11,341	12,500	11,992	15,004	50,837
	Percentage.....	22.31	24.59	23.59	29.51	100.00

The year 1879 was no exception to the rule, that the largest number of marriages in Rhode Island are solemnized in the last quarter, and the smallest number in the first quarter of the year. It will be noticed that the percentage of the last quarter in 1879, is almost exactly the same as the average of twenty-six years of registration, and that of the first quarter of 1879, varying from the same by only about one-half of one per cent.

The marriages in the third quarter have also been uniformly less in number than those in the second.

The lessened number of marriages in the first quarter, is undoubtedly due, in a large measure, to the ecclesiastical sentiments of a considerable part of the population; and the larger number of the last



quarter, to the instinct for companionship manifested more strongly during the cold season, in connection with the greater exuberance of the social sentiments so universally prevalent during the season of the holidays.

#### NATIVITY OF PERSONS MARRIED.

The following Table shows the number of marriages, according to the nativity of the parties, for each of the last eight years, and also for the aggregate of twenty years, from 1858 to 1877, inclusive:

TABLE XXIX.

BIRTH-PLACE.	1879.	1878.	1877.	1876.	1875.	1874.	1873.	1872.	20 years. 1858-77. Total.
United States.....	1,511	1,455	1,407	1,403	1,467	1,495	1,630	1,488	26,674
Foreign Countries.....	467	493	496	513	614	695	703	690	10,963
American groom, foreign bride....	309	181	177	144	191	154	138	155	2,410
Foreign groom, American bride. ...	309	195	302	194	213	197	170	204	2,750
Not stated.....									64
Total.....	2,396	2,334	2,382	2,353	2,445	2,541	2,630	2,537	41,961

There was a very considerable increase in the number of marriages reported in 1879, in all classes, except that in which both parties were foreign born. That class has not only been declining in numbers gradually, in almost every one of the last twelve years, but, as will be seen on another page, has, as might be expected, declined also in percentages.

This fact was accounted for in the Report for 1878, on the suggestion that the proportional number of adults of strictly foreign birth, among the so called foreign population, is decreasing; diminished by lessened immigration and by death. The number of those in the periods of life in which the marriage relation is most frequently assumed, is diminishing from advancing age. The number of marriages of persons of purely foreign birth must, therefore, under the existing order of events, continue to decrease, while the number of those born of parents of foreign birth, but are themselves of American birth, who have attained, or are rapidly attaining the marriageable age, are steadily increasing, and must continue to help swell the number of marriages of the native Americans.

In both classes of mixed marriages, that is, where one party was American born and the other foreign born, there was a larger number than ever before reported. In that class in which the groom was of foreign birth and the bride American, there has been invariably, in every year previous to 1879, the largest number of marriages; but the difference between the two has been gradually lessening, and they now, in 1879, stand on an equal footing.

In the following Table are given the percentages of American, foreign and mixed marriages in each of the last eight years, and in the aggregate for the twenty years, 1858 to 1877, inclusive. By *mixed* marriages are meant those where one party was of American and the other of foreign birth:

TABLE XXX.

BIRTH-PLACE.	1879.	1878.	1877.	1876.	1875.	1874.	1873.	1872.	20 years. Total.
United States.....	63.06	62.60	61.66	62.23	59.04	58.84	61.60	58.65	61.33
Foreign Countries.....	19.49	21.22	21.73	22.77	24.70	27.85	26.69	27.20	26.19
Mixed.....	17.45	16.18	16.61	15.00	16.26	13.81	11.71	14.15	12.48
Total.....	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

The percentage of marriages of parties exclusively American, in 1879, as shown in the above Table, is larger than during any one of the previous years shown in the Table, and also larger than the average of twenty-two years.

Attention is particularly called to the diminished percentage of marriages among the foreign born. From a percentage of 27.35, in 1874, the number has gradually fallen off to a percentage of 19.49, in 1879. Reference in regard to this fact is made to remarks under Table XXIX.

#### AGES OF PERSONS MARRIED.

The number of persons married in Rhode Island, during the year 1879, in the different periods of life, is shown in Table V., on page 8. The number of each sex, in each division of age, can also be found in the following Table:

TABLE XXXI.

1879.	Under 20.	20 to 25.	25 to 30.	30 to 35.	35 to 40.	40 to 45.	45 to 50.	50 to 55.	55 to 60.	60 to 65.	65 to 70.	70 to 75.	75 to 80.	80 to 85.	85 to 90.	Not stated.
Males.....	94	905	691	304	158	81	46	37	23	21	17	9	2	2	1	5
Females.....	545	974	465	177	114	42	32	19	16	5	1	.....	.....	.....	.....	6
Total.....	639	1,879	1,156	481	272	123	78	56	39	26	18	9	2	2	1	11

The caprices of social sentiment and affection are well presented in Table V., on the eighth page. The record there will show that six men between 40 and 45 married women under 20; seven men between 45 and 50, four between 50 and 55, and three between 55 and 65, took wives between 20 and 25. There were also three grooms between 20 and 25 who took brides between 35 and 40; and one groom of 20 years who took a bride of 45. Thirty-four grooms took brides of the age of ten years or more older than themselves. Two hundred and seventeen women were married to men one or more years younger than themselves. One groom between 85 and 90 took a bride between 55 and 60.

The following Table shows the number of persons married in Rhode Island, including both sexes, in each division of ages, in each of the last fourteen years, from 1866 to 1879, inclusive:

TABLE XXXII.

YEARS.	Under 20.	20 to 25.	25 to 30.	30 to 35.	35 to 40.	40 to 45.	45 to 50.	50 to 55.	55 to 60.	60 to 65.	65 to 70.	70 to 75.	75 to 80.	80 to 85.	85 to 90.	Not stated.
1866 .....	693	1,931	1,025	419	213	127	81	59	25	21	12	7	.....	.....	.....	23
1867 .....	696	1,896	1,104	416	211	148	91	48	37	18	18	5	3	1	.....	6
1868 .....	644	1,835	1,050	432	219	133	82	61	30	29	11	8	4	.....	.....	32
1869 .....	642	1,814	1,051	468	227	134	79	46	35	15	11	2	3	2	.....	49
1870 .....	744	1,893	1,084	415	216	159	86	64	26	24	12	3	2	.....	.....	6
1871 .....	697	1,914	1,118	392	228	115	73	56	35	22	6	7	3	.....	.....	6
1872 .....	786	2,073	1,182	434	237	131	81	61	43	21	13	6	1	.....	.....	5
1873 .....	762	2,177	1,156	507	253	140	87	68	35	24	12	6	6	.....	.....	27
1874 .....	770	1,992	1,179	459	268	159	101	52	36	39	8	9	1	.....	.....	9
1875 .....	681	2,058	1,108	475	252	150	101	60	32	29	13	4	1	.....	.....	6
1876 .....	691	1,741	1,041	450	224	154	80	53	27	19	12	3	2	.....	.....	9
1877 .....	681	1,745	1,118	459	244	125	92	52	46	14	15	11	2	1	.....	9
1878 .....	618	1,832	1,123	441	259	162	74	49	39	20	17	2	4	.....	.....	8
1879 .....	639	1,879	1,156	481	272	123	78	56	39	26	18	9	2	2	1	11

The increased number of marriages, in 1879, shows in the above Table, as might be expected, a larger number in nearly every one of the division of ages as compared with 1877 and 1878. The number between 40 and 45 years is 39 less than in the previous year, and between 50 and 60 years, it is the same. With the exception of 1873, in which year there was the largest number of marriages ever recorded in the State, the number between 30 and 35 was larger than in any preceding year.

For the first time, a column is presented for the number of those married who have reached the age of 85 years or more.

#### PROPORTION OF SEX.

The following Tables will show the percentages of males and females married, in each division of ages, in each of the last twenty years:

#### TABLE XXXIII.

	YEARS.	PROPORTION OF SEX.						Total.
		Under 20.	20 to 25.	25 to 30.	30 to 40.	40 to 50.	50 & over.	
MALES.	1860.....	5.0	42.8	26.9	16.8	5.7	3.3	100.00
	1861.....	4.6	44.5	25.4	15.5	5.8	4.2	100.00
	1862.....	4.2	37.8	27.9	18.3	5.9	5.9	100.00
	1863.....	3.5	38.0	29.6	17.2	5.8	5.9	100.00
	1864.....	4.3	38.8	27.3	17.9	7.4	4.3	100.00
	1865.....	3.5	37.0	28.4	18.9	7.5	4.7	100.00
	1866.....	5.3	40.9	27.0	16.4	6.3	4.1	100.00
	1867.....	4.3	40.1	27.9	16.8	6.8	4.1	100.00
	1868.....	4.1	39.9	28.2	17.1	6.1	4.6	100.00
	1869.....	4.3	39.6	27.7	18.5	6.1	3.8	100.00
	1870.....	4.8	40.4	28.1	16.0	6.4	4.3	100.00
	1871.....	5.3	40.1	28.9	16.5	4.9	4.3	100.00
	1872.....	4.3	41.3	28.2	16.6	5.2	4.4	100.00
	1873.....	3.8	42.4	26.7	17.0	6.0	4.1	100.00
	1874.....	4.1	40.4	27.2	17.5	6.4	4.4	100.00
	1875.....	3.5	40.9	27.8	17.5	6.1	4.2	100.00
	1876.....	5.1	37.5	28.6	17.9	5.6	4.3	100.00
	1877.....	4.3	36.0	30.2	18.7	5.9	4.9	100.00
	1878.....	3.9	38.5	29.0	18.0	6.3	4.3	100.00
	1879.....	3.9	37.8	28.8	19.3	5.4	4.3	100.00

TABLE XXXIV.

YEARS.							Total.
	Under 20.	20 to 25.	25 to 30.	30 to 40.	40 to 50.	50 & over.	
1860.....	25.8	44.1	17.0	9.1	2.6	1.4	100.00
1861.....	29.6	42.0	15.2	7.8	4.1	1.3	100.00
1862.....	24.9	41.3	16.7	11.8	4.1	1.2	100.00
1863.....	24.9	42.6	16.9	9.8	4.1	1.7	100.00
1864.....	24.2	43.4	17.8	10.3	2.9	1.4	100.00
1865.....	22.6	42.3	19.1	11.0	3.5	1.5	100.00
1866.....	24.7	42.9	17.4	11.0	2.7	1.3	100.00
1867.....	25.4	40.5	19.3	10.0	3.4	1.4	100.00
1868.....	24.4	40.9	18.1	11.6	3.3	1.7	100.00
1869.....	24.1	40.5	18.7	12.1	3.4	1.2	100.00
1870.....	26.8	39.4	17.9	10.8	3.9	1.3	100.00
1871.....	24.6	41.9	19.1	10.1	3.1	1.2	100.00
1872.....	26.7	40.5	18.4	9.9	3.2	1.3	100.00
1873.....	25.3	40.8	17.5	12.0	2.7	1.7	100.00
1874.....	26.3	38.1	19.3	11.1	3.9	1.3	100.00
1875.....	23.9	42.1	16.8	11.8	4.0	1.4	100.00
1876.....	25.6	39.8	17.6	12.0	3.7	1.3	100.00
1877.....	23.4	40.4	18.8	12.1	3.6	1.7	100.00
1878.....	22.7	40.4	19.3	12.2	3.8	1.6	100.00
1879.....	22.8	40.7	19.4	12.1	3.0	2.0	100.00

Tables XXXIII. and XXXIV. are instructive in that they show an improved public sentiment in the direction of marriages at a premature age. While, as in all social statistics, the percentages vary from year to year, the average of the last ten years in the marriages of persons under 20 years of age, as compared with the ten years preceding the last ten, has declined. In marriages of females, the aggregate percentage under 20 years of age, during the ten years from 1860 to 1869, inclusive, was 27.06; during the ten years from 1870 to 1879, inclusive, it was 24.60. The relative proportions during the last two years have, however, been almost exactly alike, in each sex. Among the males, the proportions have not varied very much between the two periods of ten years, in the marriages between the ages of 20 and 25; and between 25 and 30; but between 30 and 40, there has been an increase. Among the females, the proportions between the ages of 20 and 25; and between 25 and 30; have been about the same during each ten years; but between the ages of 30 and 40 there has been a

decided increase in the last ten years. The proportions in the more advanced ages, not stated above, in either of the periods of ten years, have not materially changed in either sex.

It will be noticed that the percentage of males married under 20 years of age is in every year greatly less than that of females.

The average of twenty years shows that in every 100 males married, there were about four under 20 years of age, while in every 100 females married, there were about twenty-six under 20 years of age.

#### COLORED MARRIAGES.

There were 61 marriages of persons of color in Rhode Island during the year 1879. They were reported from the following towns, the number in each town being set opposite the name:

Providence City.....	44	East Greenwich.....	2
Newport City .....	7	Charlestown.....	2
South Kingstown.....			2

Pawtucket, Scituate, Hopkinton and Westerly, each one.

There is a considerable falling off from the number in 1878, which was 80. The number in 1879, however, is nearly the average of several previous years.

It may be of interest to see what the proportion of colored persons married in 1876, 1877, 1878 and 1879, bears each year to the whole number of colored persons in the State, and also the proportions of the same, compared with the proportions which the whole number of persons married, bear to the whole population of the State, for the same periods of time.

	1879.	1878.	1877	1876.
Ratio of whole number of persons married to whole population of the State.	One in every	One in every	One in every	One in every
.....	57.8.....	55.7.....	56.6.....	57.8.....
Ratio of colored persons married to whole of colored population in the State.	.....	.....	.....	.....
.....	51.4.....	39.1.....	49.0.....	53.1.....

The fluctuations in the proportions of persons married, to the population, in both white and colored, are quite apparent in the above summary. It will be seen that in both classes the proportions are nearly the same as in 1876, with greater changes in the colored than in the white. The ratio, however, has been uniformly larger in the colored.

## DIVORCES, 1879.

The number of applications for divorce reported from the different counties in Rhode Island, in 1879, was 255. This number is 3 less than in 1878, and 2 less than in 1877.

During the year 1879, there were 246 applications for divorce granted, which were 50 more than in 1878, and 68 more than in 1877.

The following Table shows the number of applications for divorce, and the number granted, in 1879, in each county of the State; also, the causes alleged for the applications. Full reliance cannot be placed in the causes alleged, the real causes, no doubt, being sometimes withheld:

TABLE XXXV.

COUNTIES.	Number of Applications.	Number Granted.	CAUSES ALLEGED.					
			Adultery.	Extreme Cruelty.	Willful Desertion.	Continued Drunkenness.	Neglect to Provide Necessaries, &c.	Other Gross Misbehavior.
Bristol.....	7	5	1	2	5	3	3	2
Kent.....	18	19	2	1	9	2	4	
Newport.....	9	7	3	1	4		3	
Providence.....	196	195	39	40	125	34	136	1
Washington.....	25	20	3	5	10	3	8	
Whole State.....	255	246	48	49	153	42	156	1

As usual, there are a large number of alleged causes given as a reason why divorce should be granted. Of the whole number, 482, of causes alleged, 156 were for "neglect to provide necessaries of life;" 153 for "willful desertion;" 49 for "extreme cruelty," and 48 for "adultery." The number of each of the causes alleged vary from year to year, but the same reappear every year. In 1879 an additional cause, "impotency," was averred.

As some of the applications for divorce in each year are continued, and may be granted or refused in some other year, the number granted or refused will be shown more accurately by taking the aggregate of applications for several years.

The following are the numbers for the last seven years:

	Applications for Divorce.	Divorces Granted.	Applications refused or continued or withdrawn.
1873.....	261.....	173.....	88
1874.....	276.....	242.....	34
1875.....	227.....	158.....	69
1876.....	254.....	196.....	58
1877.....	267.....	178.....	79
1878.....	258.....	196.....	62
1879.....	255.....	246.....	9
7 years total.....	1,788.....	1,389.....	399

From the above, it appears that nearly 78 per cent. of all the applications were granted.

The following Table shows the number of divorces granted in each county, and in the whole State, in each of the last eleven years, with the proportion of marriages to each divorce granted, in each year:

TABLE XXXVI.

YEARS.	Bristol County.		Kent County.		Newport County.		Providence County.		Washington County.		Whole State.	
	Divorces Granted.	Marriages to one Divorce.	Divorces Granted.	Marriages to one Divorce.	Divorces Granted.	Marriages to one Divorce.	Divorces Granted.	Marriages to one Divorce.	Divorces Granted.	Marriages to one Divorce.	Divorces Granted.	Marriages to one Divorce.
1869.....	10	10.6	15	12.5	6	27.7	120	13.8	11	15.5	162	14.1
1870.....	3	27.7	18	11.8	6	26.3	152	11.3	21	9.3	200	11.8
1871.....	5	16.8	11	17.9	4	49.7	123	13.3	18	11.4	161	14.5
1872.....	8	10.2	13	15.7	8	22.9	149	12.6	22	8.9	200	12.7
1873.....	6	16.2	22	9.8	8	21.9	131	14.8	6	33.7	173	15.2
1874.....	10	8.9	20	8.0	6	29.0	190	10.0	16	11.6	242	10.5
1875.....	2	50.0	18	8.8	7	23.4	120	14.9	11	20.5	158	15.7
1876.....	6	14.5	15	12.8	7	20.5	148	11.1	20	8.8	190	11.5
1877.....	7	12.0	9	16.3	7	26.0	134	12.4	21	9.9	178	12.8
1878.....	4	26.0	11	13.3	13	12.8	156	10.9	12	17.3	196	11.9
1879.....	5	18.8	19	9.0	7	24.1	196	9.1	20	9.7	246	9.7

The number of divorces granted in 1879, was very considerably larger than in any preceding year. That there should be a proportion of more than one divorce to every ten of the marriages in Rhode Island, is evidence of a lamentable misapprehension of the obligations assumed in the marriage contract.



## DEATHS, 1879.

There were 4,472 deaths reported in Rhode Island during the year 1879. The number is 31 larger than in 1878, and larger by 22 than in any preceding year.

The death rate, as previously shown in Table XIV., on the forty-eighth page, was one to every 61.87 of the population, or 16.2 in each one thousand.

In 1878, as will be found in the Report of that year, with the number of deaths only 31 less, the death rate was one to every 58.10 of the population, or 17.2 in each thousand.

The apparent discrepancy is owing to the basis of comparison. That of 1878 is according to the Census of 1875, and that of 1879, according to the Census of 1880. In reality, the rate of mortality, in the whole State, during the last six years has not varied fourteen hundredths of one per cent.

In the different localities in the State, the death rate varies very considerably, as before stated, and as might be expected. The causes are various, independent of the prevalence of epidemics.

The city of Providence contains rather more than three-eighths of the whole population of the State, and presents the conditions of city life under circumstances as favorable to longevity, probably, as any city of considerable magnitude in the country.

In the Report of 1878, a synopsis was presented showing the difference in the death rates of the city and the State, during three years, from 1876 to 1878, inclusive.

In the following summary there will be presented comparisons of the same, for the three years, from 1877 to 1879, inclusive. It will be observed that the proportions of 1879 are in accordance with the Census of 1880:

	Population.	Number of Deaths.	One death in every	In each 1000.
1877. { Providence City .....	100,675 .....	1,938 .....	51.90 .....	19.36
Rest of State .....	157,564 .....	2,512 .....	62.70 .....	15.94
Whole State .....	258,239 .....	4,450 .....	58.30 .....	17.20
1878. { Providence City .....	100,675 .....	1,969 .....	50.62 .....	19.80
Rest of State .....	157,564 .....	2,452 .....	64.26 .....	15.56
Whole State .....	258,239 .....	4,441 .....	58.10 .....	17.20
1879. { Providence City .....	104,862 .....	2,026 .....	51.76 .....	19.33
Rest of State .....	171,848 .....	2,446 .....	70.25 .....	14.02
Whole State .....	276,710 .....	4,472 .....	61.87 .....	16.20

From the above, it appears that during the year 1879, there was a greater difference in the rates of mortality between the city of Providence and the rest of the State, and also between the city and the whole State, than in either of the two preceding years. It is known that the year 1879 was unusually healthy in *nearly all* the towns in the State. At the same time, it was the experience of nearly all the medical profession, that, though there was a less number sick, there was a larger percentage of deaths among that number. In the city of Providence, the mortality was largely increased by an epidemic of Scarlet Fever, which alone caused the death of 252 individuals.

It should also be stated that a part of the difference between Providence city and the rest of the State, is due to the failure, in some of the towns, to report the whole number of deaths that occur in them. The subject of contrast between the city and the rest of the State, will be again taken up under the head of "Season and Mortality."

## SEX OF DECEDENTS.

Of the 4,472 persons, whose deaths were returned during the year 1879, 2,183 were males, and 2,289 were females; the ratio standing at 95.37 males to each 100 females, or 48.81 males, and 51.19 females in each 100 decedents.

The following Tables, XXXVII. and XXXVIII., show the number and proportion of males and females among the decedents, and also among the children born in Rhode Island, during the ten years, 1853 to 1862, inclusive; also in each of the seventeen years from 1863 to 1879, inclusive, and for the entire period of twenty-seven years:

TABLE XXXVII.

DEATHS.	10 years, 1853-1862		or	
	males	females	males to 100 females	females to 100 males
1853	1,621	1,586	102.2	97.8
1854	1,633	1,727	94.5	105.8
1855	1,686	1,719	98.1	101.9
1856	1,497	1,473	101.6	98.4
1857	1,442	1,447	99.7	100.3
1858	1,413	1,499	94.3	106.0
1859	1,696	1,686	100.6	99.4
1860	1,588	1,650	96.2	103.8
1861	1,621	1,723	94.1	106.3
1862	2,118	2,129	99.4	100.6
1863	2,166	2,237	96.5	103.5
1864	2,111	2,118	99.7	100.3
1865	2,108	2,209	95.4	104.8
1866	1,969	2,147	91.7	108.9
1867	2,182	2,318	92.0	108.7
1868	2,161	2,280	94.8	105.5
1869	2,188	2,289	95.4	104.8
27 years	42,075	43,506	96.7	103.3

TABLE XXXVIII.

BIRTHS.	10 years, 1853-1862	18,377 males	17,280 females	or 106.4 males to 100 females.
	1863	1,894 males	1,788 females	or 106.8 males to 100 females.
	1864	1,949 males	1,942 females	or 100.3 males to 100 females.
	1865	2,096 males	1,857 females	or 112.9 males to 100 females.
	1866	2,546 males	2,356 females	or 108.1 males to 100 females.
	1867	2,655 males	2,464 females	or 107.7 males to 100 females.
	1868	2,745 males	2,627 females	or 104.5 males to 100 females.
	1869	2,685 males	2,560 females	or 104.9 males to 100 females.
	1870	2,679 males	2,536 females	or 106.6 males to 100 females.
	1871	2,878 males	2,800 females	or 102.8 males to 100 females.
	1872	3,085 males	3,058 females	or 100.9 males to 100 females.
	1873	3,135 males	2,887 females	or 108.6 males to 100 females.
	1874	3,311 males	3,155 females	or 104.9 males to 100 females.
	1875	3,362 males	3,146 females	or 106.9 males to 100 females.
	1876	3,291 males	3,038 females	or 108.3 males to 100 females.
	1877	3,168 males	3,073 females	or 103.0 males to 100 females.
	1878	3,402 males	3,312 females	or 102.7 males to 100 females.
	1879	3,259 males	3,091 females	or 105.4 males to 100 females.
	27 years	66,510 males	62,949 females	or 105.7 males to 100 females.

There were 22 more males, and 9 more females, among the decedents of 1879, than in the year 1878, and the proportion of males to females was greater, and thereby more nearly equal as compared with the preceding year.

Among the children born there were 143 less males, and 221 less females than in 1878, the inequality of proportion being greater than in the preceding year.

Upon an examination of the foregoing Tables it will be seen that, in the aggregate of twenty-seven years, and also in each of the seventeen years, with three exceptions only, there has been an excess of females in the record of mortality, and an excess of males in the record of births.

As observed in a previous Report, a natural inference would be, that the male portion of the population must be largely in excess of the female portion, and annually increasing.

By reference to Table VII., page 14, in the Report for 1878, it will be seen, however, that by the Census of 1875, the females exceeded the males in the population of the State, by 7,119. (The number of the sexes, by the Census of 1880, had not been made public when this Report was prepared.) The difference in numbers must be accounted for on the supposition of a larger proportional emigration of native males from the State.

#### SEASON AND MORTALITY.

The whole number of decedents, and the sex of the same, in each month of the year 1879, and in each division of the State, may be found in Table VI., on the ninth page.

The influence of season upon mortality, may be further illustrated by the following Table, which shows the number and percentage of deaths, in each quarter of each of the last five years, and in the aggregate for the twenty-five years, from 1853 to 1877, inclusive:

TABLE XXXIX.

SEASON.	1879.		1878.		1877.		1876.		1875.		1853-1877.	
	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
January-March ....	1,185	26.49	1,158	25.87	936	21.08	948	23.03	1,101	25.50	17,646	22.16
April-June.....	989	20.99	968	21.81	958	21.53	942	22.89	912	21.13	16,513	20.74
July-September....	1,174	26.26	1,175	26.46	1,317	29.60	1,349	30.34	1,244	28.82	23,464	29.46
October-December	1,174	26.26	1,140	25.86	1,239	27.84	977	23.74	1,060	24.55	22,006	27.64
Total.....	4,472	100.00	4,441	100.00	4,450	100.00	4,116	100.00	4,317	100.00	79,629	100.00

The percentages of mortality in Rhode Island in connection with the season, during 1879, show a marked departure from the rule established by twenty-seven years of registration. As will be seen in the Table above, the third quarter in each year during the last five years, and in the summary of twenty-five years, has invariably shown much the largest proportional number of deaths. In 1879, the third quarter shows the same number as the fourth, and a less number than the first. The greatly increased percentage of the first quarter, quite reverses that of all preceding years. There was an unusual prevalence of diphtheria and scarlatina in some localities during the winter and spring months; and an unusual exemption from diarrhoeal diseases, especially cholera infantum, during the hot months throughout the State, which will in considerable measure account for the change in the quarterly percentages of deaths.

The question of the influences of city life upon the status of mortality is often presented, and it has been the custom in former Reports to contrast the city of Providence, which comprises about three-eighths of the entire population of the State, with the rest of the State, in regard to the influence of *season* upon mortality.

The following Table will present a comparison between the city and rest of the State, in relation to the mortality of each section by seasons. It will show the number and percentage of deaths in each quarter of the year 1879, in the city, and in the rest of the State sep-

arately; and also the percentage of deaths in each quarter of the year in the city of Providence, for twenty-four years, from 1855 to 1878, inclusive; and in the whole State, including the city, for twenty-six years, from 1853 to 1878, inclusive:

TABLE XL.

SEASON.	1879.				1855-1878.		1853-1878.	
	Providence.		Rest of State.		Providence.		Whole State.	
	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
January—March.....	514	25.38	671	27.43	7,519	23.89	18,904	23.28
April—June.....	499	21.66	500	20.44	6,909	21.93	17,481	21.53
July—September.....	498	24.33	681	27.83	9,353	29.76	24,639	30.37
October—December.....	580	28.63	594	24.30	7,683	24.42	20,146	24.82
Total.....	2,096	100.00	2,446	100.00	31,464	100.00	81,170	100.00

It will be observed by an inspection of Table XL., that the differences of the percentages of mortality in the same season in 1879, between the city of Providence and the rest of the State, are very considerable. In the first and third quarters, the proportions were more than three per cent. larger in the rest of the State than in the city, while in the second quarter, it was about one and one-quarter per cent. less, and in the fourth quarter it was more than four and one-quarter per cent. less than in the city. But taking a considerable number of years together, as will be seen in the summaries of twenty-four and twenty-six years, the average percentages of mortality, in the different quarters of the year, vary very little between the city of Providence and the whole State.

It will be understood that the above summary does not show the exact difference between the city and rest of the State, for the reason that the mortality of the different seasons in the city, is included in the general summary of the whole State.

Below may be found a general view of the order of the months, in which occurred from the largest to the smallest number of deaths, in the whole State, in each of the last five years:

TABLE XII.

1879.	1878.	1877.	1876.	1875.
1. January.... 468	December.... 421	September... 454	August... .. 469	August..... 471
2. August.... 453	August..... 420	August..... 450	July . . . . . 444	September.. 419
3. December.. 395	July..... 410	October..... 430	December.... 348	February... 392
4. October.... 391	January.... 400	July..... 413	March..... 341	January. ... 363
5. November.. 398	March ..... 396	December.... 411	September... 336	December... 356
6. July..... 383	November.. 377	November... 398	October..... 334	November.. 357
7. March..... 382	February.... 362	March..... 347	May..... .. 332	July..... .. 354
8. April..... 342	April..... 350	May... .. 343	April..... 329	March..... 346
9. September.. 339	September... 345	January..... 323	February.... 312	October.... 345
10. February... 335	October..... 342	April..... 310	January... .. 295	May..... .. 333
11. May..... 318	June..... 310	June..... 305	November.. 295	April..... 314
12. June..... 279	May..... 306	February... 266	June... .. 281	June..... 295
4,472	4,441	4,450	4,116	4,317

During the last three years, the changes in the first four of the months in each year, in which occurred the largest number of deaths, have been unprecedented. August, which has taken the lead, with few exceptions, for a quarter of a century, has been second in order since 1876. January, which was the tenth in order in 1876, and the ninth in 1877, takes the first place in 1879. December, which was first in 1878, and fifth in 1877, follows August, and takes the second place. October, usually one of the healthiest months in the year, and tenth in order in 1878, occupies the fourth place in order in 1879. May and June are the last in order in 1879, and with few exceptions have been for the whole period of registration. Nearly all diseases assume a milder form during those months.

In the city of Providence, in 1879, the largest number of deaths occurred in December; but taking a period of twenty-five years, the greatest number of deaths have occurred in the following months, in the order named: 1. August. 2. July. 3. September.

#### PARENTAGE OF DECEDENTS.

During the year 1879, there were reported from the different towns in Rhode Island the deaths of 4,472 persons. Of these, 2,294 were of American parentage, and 2,178 were of foreign parentage.

The parentage in these Reports, when not otherwise specified, is reckoned according to the reported nativities of the fathers.

The parentage of the decedents, in the different towns in the State, may be found in the general abstract for 1879, on the second and third pages.

There were no decedents of foreign parentage, in 1879, reported from the following five towns, viz.: West Greenwich, Little Compton, New Shoreham, Foster and Exeter.

The decedents of foreign parentage in the following six towns, numbered three or less, viz.: Barrington, Coventry, Jamestown, Middletown, Charlestown and Hopkinton.

The towns in which the number of decedents of foreign parentage exceeded those of American parentage, were as follows: Warren, Cumberland, Lincoln, North Providence, North Smithfield, Pawtucket, Woonsocket and Providence. In Johnston, the number of each class was equal. In Cranston there was one more of American than of foreign.

In the towns in which there was an excess, above the American, of decedents of foreign parentage, the proportions of excess were about as follows: Warren, 33 per cent.; Cumberland, 80 per cent.; North Providence, 40 per cent.; North Smithfield, 30; Pawtucket, 2.5; Providence city, 1.5 per cent. In Lincoln there were nearly three times as many of foreign as of American parentage, and in Woonsocket more than four times as many.

The following Table gives the number and percentage of decedents of American and of foreign parentage, in each of the last five years; and in the aggregate for twenty-two years, or from 1858 to 1879, inclusive:

TABLE XLII.

PARENTAGE.	1879.		1878.		1877.		1876.		1875.		1858-1879.	
	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
American.....	2,294	51.29	2,281	51.38	2,279	51.21	2,150	52.94	2,466	57.12	52,832	56.25
Foreign.....	2,178	48.71	2,160	48.64	2,171	48.79	1,966	47.76	1,851	42.88	40,702	43.75
Total.....	4,472	100.00	4,441	100.00	4,450	100.00	4,116	100.00	4,317	100.00	93,534	100.00

It will be seen that the decedents of foreign parentage are steadily increasing in number and proportion from year to year. Previous to 1874, the percentage of decedents of foreign parentage had averaged, during a period of seventeen years, less than 41.00 per cent. An examination of the above Table will show that the average proportion of the same parentage during the last four years, is 48.5 per cent. The proportional average of decedents of American parentage, during

the same four years, is 51.5 per cent., while the average of decedents of the same parentage, during a period of seventeen years previous to 1874, was 58.28 per cent.

It should be borne in mind, that the term "foreign parentage," as made use of above, does not mean that the decedents were all foreign born, but includes the foreign born, and all those whose fathers were of foreign birth, though of themselves American born.

It will thus be seen that as the population by foreign parentage increases, the death rate must also increase. But the percentage of mortality, under the term "foreign parentage," must, in a few years, decline, because the children born in the United States of foreign parents are rapidly reaching the adult age, and as they become parents, their children will be classed as of American parentage.

#### AGE OF DECEDENTS.

A statement of the aggregate and average age of all the reported decedents of each sex, in each town and county in the State, in 1879, may be found in Table I., on pages 2 and 3.

It will there be seen that the average age of all the male decedents, in 1879, was 31.29 years, and the average age of all the female decedents was 33.24 years.

The average age of all the male decedents, in 1878, was 29.02 years, and of female decedents, 31.11 years. The highest average age of male decedents, in any town in the State, in 1879, was 71.9 years, in Charlestown; the highest average age of females, 71.7 years, in Foster.

The lowest average age of male decedents was 5.5 years, in West Greenwich; the lowest average age of females was 1 year, in Jamestown.

There is very little value in the reported average age of decedents in single years, in towns with a few hundred inhabitants, or even a few thousand. Take the town of Jamestown, for instance. In 1878 there occurred the death of a single female, aged 83 years, and the deaths of three males, whose joint ages amounted to 171 years; the aggregate age of all 254 years, and the average age 63.5 years. In 1879 there occurred in that town the death of one male, aged 47 years, and one female, aged one year; aggregate age of all 48 years, and average age 24 years. Thus it will be seen that it is only by the average of a series of years, that an approximation to the relative longevity of the inhabitants of any town can be ascertained.

In Table XV. there will be found the aggregate and average age of all the decedents in the different towns in the State, during a period of ten years. An examination of that Table will show that in a



series of years, the average age of the decedents in Jamestown, instead of being 24 years, as in 1879, is 51.6 years.

In the city of Providence, which, from its large population, presents a more uniform average age of decedents from year to year, the average age of male decedents was 28 years in 1879, as against 24.2 years in 1878.

Of the female decedents in Providence city, the average age was 29.5 years in 1879, and 27.9 years in 1878.

The average age of all decedents of both sexes, was 28.8 years in 1879, and 26 years in 1878.

There were three towns in the State that reported an average age of decedents in 1879, which was less than that of Providence city, viz.: Woonsocket, 25.2 years; Jamestown, 24 years, and Lincoln, 23.7 years.

The following Table shows the average age of the decedents, in each of the larger divisions of the State, in each of the last five years, and also in the aggregate of each of four periods of five years each, comprising the twenty years from 1858 to 1877, inclusive:

TABLE XLIII.

DIVISIONS OF THE STATE.	1879.	1878.	1877.	1876.	1875.	1873-1877. 5 years.	1868-1872. 5 years.	1863-1867. 5 years.	1858-1862. 5 years.
Bristol County.....	40.87	29.08	32.19	39.53	29.90	33.61	35.12	34.78	35.56
Kent County.....	35.15	33.68	35.78	39.39	35.77	36.90	34.77	35.81	32.15
Newport County.....	37.62	39.06	43.96	39.17	45.94	40.68	40.04	33.64	35.01
Providence Co., Towns	32.45	30.98	28.16	31.69	30.19	28.46	25.96	29.16	28.44
Providence City... ..	28.82	26.09	27.74	26.41	28.57	27.19	25.45	28.50	26.78
Washington County...	43.44	42.34	43.68	43.09	37.17	41.14	39.67	30.87	34.21
Whole State .....	32.29	30.09	30.45	32.37	31.27	30.28	31.66	30.75	29.42

The average age of the total decedents of each of the larger divisions of the State, in 1879, was greater than in 1878, except Newport county, which was less by about one and one-half years.

The difference in Bristol county, about eleven years, is quite unusual. Nearly 41 years, is a greater average than ever before reported from Bristol county, and is about six years greater than the average age during a period of twenty years.

Washington county shows an average age of 43.44 years, which is greater, with one exception, than any previous year. This county has the greatest average age of any section or division of the State.

In the whole State, the average age, 32.29 years, is also greater, with perhaps two exceptions, than in any previous year, and greater by about two and one-quarter years than the average of twenty-one years, from 1858 to 1878, inclusive, which was 30.04 years.

#### PERCENTAGES OF DECEDENTS AT DIFFERENT AGES.

In Table VII., on pages 10 to 15, inclusive, will be found the number of deaths in 1879, in each town and each county, of each sex, and in each period of life, with the percentage of the whole number of deaths in each division, to the population of the same.

The following Table shows the percentages of decedents in each division of ages in each of the last eight years, and in the aggregate for two periods; one of ten years and seven months, from June 1st, 1852, to December 31st, 1862, inclusive; the other of ten years, from 1863 to 1872, inclusive:

TABLE XLIV.

PERIODS OF LIFE.	1879.	1878.	1877.	1876.	1875.	1874.	1873.	1872.	10 years. 1863-1872.	10 years, 7 months. 1852-1862.
Under 1 year .....	16.1	16.6	17.4	19.5	20.8	19.9	19.3	22.8	18.0	17.6
1 and under 2 .....	6.8	8.1	8.1	7.4	6.8	7.8	9.2	8.0	7.8	9.8
2 and under 5 .....	10.1	10.3	9.5	7.0	7.0	9.4	8.1	5.5	7.9	9.6
Total under 5 .....	33.0	35.0	35.0	33.9	34.6	37.1	36.6	36.3	33.7	37.0
5 and under 10 .....	6.3	6.2	6.2	4.2	4.0	5.7	5.3	2.7	4.6	5.0
10 and under 20 .....	4.8	6.1	5.4	5.2	5.5	6.0	6.9	6.5	6.2	5.8
20 and under 30 .....	8.8	8.8	8.9	9.1	9.6	8.7	9.1	9.9	9.7	9.5
30 and under 40 .....	7.4	7.6	7.5	7.7	7.9	6.9	7.8	8.5	8.1	8.7
40 and under 50 .....	6.5	6.4	6.6	6.9	7.7	6.8	6.5	7.3	7.2	7.5
50 and under 60 .....	7.1	7.6	7.2	7.5	7.4	7.0	6.4	6.7	7.3	6.7
60 and under 70 .....	10.0	7.9	8.8	9.3	8.6	7.8	7.6	8.2	8.3	6.9
70 and under 80 .....	9.0	8.8	9.5	9.8	8.4	8.1	8.3	7.7	8.4	7.3
80 and under 90 .....	5.5	4.8	4.0	5.2	5.0	4.7	4.5	5.4	5.4	4.6
Over 90 and not stated	1.6	0.8	0.9	1.2	1.3	1.2	1.0	0.8	1.1	1.0
Total .....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

A comparison of the percentages of mortality in the different periods of life, between one year and another, during the last eight years, as presented in the above Table, will show that the proportion

of decedents under 5 years of age, during 1879, was less than in any year since 1871, and considerably less than the average of a period of more than twenty-seven years. The lessened percentage is due, in a considerable measure, to a greatly diminished number of cases of cholera infantum throughout the State, and consequently a lessened mortality from that disease.

It may be of interest to see what the changes have been, from year to year, since and including 1875.

PERCENTAGES OF MORTALITY FROM CHOLERA INFANTUM.

	1875.	1876.	1877.	1878.	1879.
Rhode Island, {	7.74	6.41	6.08	3.97	3.81

It will thus be seen that the mortality from cholera infantum has diminished more than one-half within the last five years.

During the year 1879, as compared with the year 1878, the difference in percentage of deaths has been chiefly in the divisions of ages, between one and two, between ten and twenty, and between sixty and seventy.

There seems to be something of the law of compensation acting in the production of mortality in the different divisions of the State. This is shown by the lessened percentage of deaths in one town from the usual diseases, while it is increased in another from the presence of an epidemic of fatal type; or, as it is frequently observed, the circumstance of increased prevalence of disease of one kind, and the unusually lessened prevalence of some other, may occur at the same time in the same town or city.

As an instance, while cholera infantum has caused a greatly decreased number of deaths during the last two years, in children under five years of age, diphtheria and scarlatina have taken its place in some locations, and have increased the percentage of deaths in that period of life.

The different circumstances that act as factors in the production of percentage of mortality, in the different towns and in the different periods of life, are so many and so various in character, that it would require many pages to present them and describe the manner in which the results are produced.

To show some of the strong contrasts of death rates, in the different divisions of age, in different sections of the State, the following summary is presented. It will be understood that the percentages are the proportion of deaths in each division of age, to the total deaths in each town or city taken.

		Under 1 year.	Under 5 years.	5 to 20.	20 to 50.	50 & over.
1879.		Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
State of Rhode Island,	Males	8.6	17.4	4.9	10.3	16.1
	Females	7.5	15.6	6.2	12.4	17.1
Total		16.1	33.0	11.1	22.7	33.2
Barrington		0.83	16.7	16.7	16.6	50.0
New Shoreham		16.6	16.6	00.0	00.0	83.4
Woonsocket		27.4	46.3	10.0	18.0	25.7
Charlestown		00.0	00.0	5.9	11.8	82.3
City of Providence		15.6	35.2	13.2	23.7	27.9
Foster		00.0	00.0	00.0	13.0	87.0

The average age of the decedents in each of the above towns, in 1879, was as follows: Barrington, 44 years; New Shoreham, 44.5 years; Woonsocket, 25.15 years; Charlestown, 67.23 years; Providence city, 28.82 years; Foster, 67 years.

It will be seen, as might be expected, that in those towns where the average age was greatest, the number of decedents in the earlier years of life were few or none.

In the town of Barrington, one-half of the decedents were over 50 years of age. In New Shoreham, over 83 per cent. were of the age of 50 years or more, while in Woonsocket about 75 per cent. were under the age of 50 years. In Woonsocket, it will be noticed, that nearly one-half were under 5 years of age, and more than one-quarter under one year.

In Charlestown no deaths of persons under 5 years of age occurred, and only about 6 per cent. of the total number were under 20, and about 12 per cent. under 50 years of age.

In the city of Providence, more than one-third of the whole number of decedents were under 5 years of age, and nearly one-sixth under one year.

In Foster not one death was reported under 20 years of age, and only 13 per cent. under 50 years.

Upon referring to Table XIV., page 48, it will be found that all those towns in which the percentage of mortality under 5 years of age was very small, there was also a low birth rate, and *vice versa* in towns with a large percentage of deaths under 5 years of age.

In the whole State, as compared with the year 1878, the percentages of mortality of persons of the age of five years and over, do not greatly differ. It is somewhat less between the ages of ten and twenty, and considerably increased between the ages of sixty and seventy.

The reason of the changes that occur in the average age of decedents from year to year, in the same town or city, and the difference in

the different towns and cities, will be suggested by an examination of Tables XIV. and XLIV., in connection with the foregoing remarks.

#### COLORED DECEDENTS.

The statistics of the colored population of Rhode Island are always included in the general statistics of the State. But on account of several questions of considerable importance, the statistics of births, marriages and deaths, have been separately considered. This has seemed to be of more consequence in Rhode Island, because the number of this class of the people is larger, proportionally, than in most northern States.

The number of deaths reported in 1879, among the colored population, was 168. The number is 12 more than in 1878, and 8 more than in 1877. They occurred in the different towns as follows:

Providence City.....	113
Newport City.....	21
South Kingstown.....	6
Warwick and East Providence, } 4 each.....	8
Bristol, Pawtucket and North Kingstown, } 3 each.....	9
Cranston, Lincoln and Westerly, } 2 each.....	6
East Greenwich, Little Compton, Portsmouth, Charlestown and Richmond, } 1 each.....	5
Total.....	168

*Sex.*—Of the 168 colored decedents, 67 were males and 101 females.

*Season.*—These 168 deaths were in the different months, as follows:

Months.	Deaths.	Months.	Deaths.	Months.	Deaths.	Months.	Deaths.
January.....	17	April.....	17	July.....	16	October.....	8
February.....	18	May.....	11	August.....	21	November.....	7
March.....	15	June.....	10	September.....	12	December.....	16
—	—	—	—	—	—	—	—
1st Quarter.....	50	2d Quarter.....	38	3d Quarter.....	49	4th Quarter.....	31

First six months, 88; second six months, 80. Total, 168.

*Age.*—The average age of the colored decedents in Rhode Island, in 1879, was as follows:

	Providence City.	Rest of State.	Whole State.
Colored Males.....	20.77 years	34.43 years	23.63 years.
Colored Females .....	21.10 years	38.17 years	27.93 years.

## SUMMARY OF COLORED POPULATION.

The number of births, marriages and deaths among the colored population of Rhode Island, in the several divisions of the State, in 1879, is given in the following Table, compared with the colored population in each division, as found by the State Census of 1875, the colored population by the Census of 1880 not having been ascertained when this Table went to press:

TABLE XLV.

COUNTIES.	Colored Population, 1875.	BIRTHS, 1879.		MARRIAGES, 1879.		DEATHS, 1879.	
		Number.	To population one birth in	Number.	Of population one person married in	Number.	Of population one death in
Bristol County.....	249	2	124.5	.....	.....	3	83.0
Kent County.....	365	7	52.1	2	91.2	5	71.0
Newport County.....	1,021	14	73.0	7	73.0	28	44.4
Providence County, Towns.....	423	20	21.1	2	105.7	11	38.5
Providence City.....	3,487	104	32.3	44	39.6	113	30.8
Washington County.....	726	12	60.5	6	60.5	13	56.0
Whole State.....	6,271	159	39.6	61	51.4	168	37.3

In 1878, the proportions of the above events in the whole State among the colored population were as follows: One birth in every 36.4; one person married in every 39.2; and one death in every 40.2.

In 1879, as seen above, the proportions were: One birth in every 39.6; one person married in every 51.4; one death in every 37.3.

There was a smaller proportion of births and marriages, and a larger proportion of deaths in 1879.

The difference in the vital statistics between the white and the colored population, in 1879, may be presented as follows:

White.....	One child born in every 44.7; one person married in every 59.2; one death in every 64.3.
Colored....	One child born in every 39.6; one person married in every 51.4; one death in every 37.3.
White and Colored, }	One child born in every 43.6; one person married in every 57.8; one death in every 61.9.

It will be seen that the proportions are larger among the colored, in each of the classes of events, than among the whites. The difference in the events of deaths is quite noticeable.

The following summary shows the number of births, marriages and deaths among the colored population of Rhode Island, in each of the last nineteen years, from 1861 to 1879, inclusive:

#### COLORED POPULATION.

1861.....	97 births.....	30 marriages.....	109 deaths.....
1862.....	96 births.....	23 marriages.....	90 deaths.....
1863.....	73 births.....	68 marriages.....	104 deaths.....
1864.....	69 births.....	35 marriages.....	121 deaths.....
1865.....	87 births.....	51 marriages.....	129 deaths.....
1866.....	124 births.....	65 marriages.....	123 deaths.....
1867.....	144 births.....	61 marriages.....	105 deaths.....
1868.....	147 births.....	84 marriages.....	111 deaths.....
1869.....	136 births.....	70 marriages.....	133 deaths.....
1870.....	158 births.....	70 marriages.....	123 deaths.....
1871.....	146 births.....	64 marriages.....	116 deaths.....
1872.....	171 births.....	76 marriages.....	184 deaths.....
1873.....	163 births.....	69 marriages.....	160 deaths.....
1874.....	170 births.....	80 marriages.....	151 deaths.....
1875.....	156 births.....	76 marriages.....	169 deaths.....
1876.....	170 births.....	59 marriages.....	156 deaths.....
1877.....	168 births.....	64 marriages.....	180 deaths.....
1878.....	172 births.....	80 marriages.....	156 deaths.....
1879.....	159 births.....	61 marriages.....	168 deaths.....
<hr/>			
Total.....	2,606 births.....	1,186 marriages.....	2,573 deaths.....

There was a less number of children born, a smaller number of marriages, and a larger number of deaths, in 1879, among the colored people than in either of the two previous years.

It will be noticed, that in the whole period of nineteen years the excess of births over deaths is only thirty-three.

## CAUSES OF DEATH, 1879.

The statistics of the causes of death in Rhode Island, in 1879, will be found in Tables VIII., IX. and X. The whole number of deaths, as previously stated, was 4,472. The number of which the cause of death was reported was 4,218, and the number of which the cause was not stated was 254. The number from unknown causes was 44 more than in 1878.

The following Table shows the number of deaths in 1879, in each larger division of the State, and the number and percentage in each division, of which the cause was unknown:

TABLE XLVI.

1879.	Bristol County.	Kent County.	Newport County, Towns.	Newport City.	Providence County, Towns.	Providence City.	Washington County.	Whole State.
Number of Deaths.....	150	311	95	264	1,377	2,026	249	4,472
Cause not stated.....	9	34	4	25	144	9	29	254
One in.....	16.6	9.2	23.7	10.6	9.5	225.1	8.6	17.6

It has been previously remarked that the returns of the *causes* of deaths are manifestly more unnecessarily incomplete than any other of the vital statistics of the State. That the *cause* of death in one out of every 17 or 18 of the decedents in the State should be returned as unknown, is positive evidence that there is a defect in the Registration law, as well as proof that there is neglect of duty on the part of those who should observe the law as it stands. The remedy is in the enactment of a law for the State such as is provided by municipal ordinance in the city of Providence, that is, the requirement of burial permits, and the pre-requirement of return of death, and *cause* of death when known. There is no reason why there should not be as many deaths in Providence city, from causes unknown, as in other parts of the State, when as will be seen by Table XLVI., the proportion for the whole State, including the city, is one in every 17.6, and



the proportion in the city only one in 225; while in all the towns outside the city of Providence, the aggregate of deaths reported with cause unknown, was as one to ten of the whole number of deaths, or a proportion twenty-two hundred per cent. larger.

TABLE XLVII.

*Showing the proportion of Deaths reported, with "cause unknown," in each Division of the State, and in the whole State, in each of the last seventeen years, from 1863 to 1879, inclusive.*

YEARS.	Bristol County.	Kent County.	Newport County.	Providence County, Towns.	Providence City.	Washington County.	Whole State.
1863, One in....	16.5	11.2	25.5	6.9	46.7	24.7	14.7
1864, One in....	57.0	12.6	11.6	8.5	45.7	47.6	16.1
1865, One in....	64.3	27.4	13.4	8.2	55.0	32.9	16.4
1866, One in....	163.0	11.4	22.	9.5	45.0	23.3	17.3
1867, One in....	....	13.6	34.5	7.4	64.0	14.3	14.8
1868, One in....	33.2	5.0	20.3	5.2	46.2	10.1	10.1
1869, One in....	41.2	5.8	52.8	5.3	83.6	16.1	11.3
1870, One in....	....	19.3	23.6	11.8	90.2	26.9	23.6
1871, One in....	151.0	81.2	7.9	8.4	83.6	9.8	13.0
1872, One in....	13.8	5.8	10.0	6.8	72.8	9.8	11.3
1873, One in....	....	16.0	25.4	9.8	102.5	27.5	20.3
1874, One in....	54.0	15.2	14.0	17.2	73.7	21.2	27.8
1875, One in....	55.0	7.4	15.6	13.7	91.2	11.9	20.9
1876, One in....	11.5	7.9	18.5	9.9	124.3	22.8	19.3
1877, One in....	....	17.7	9.7	11.9	323.0	16.0	23.2
1878, One in....	32.1	7.4	9.0	13.7	124.2	21.7	21.1
1879, One in....	16.6	9.2	12.4	9.5	225.1	8.6	17.6

The above Table shows very clearly the great variations that occur from year to year in the proportion of deaths reported with cause unknown, to the whole number of deaths in each division named, and in the whole State.

In Bristol county, the proportions have varied more largely than in any other division, running from a full return of the cause of every death in four out of seventeen years, to the large proportion in 1876 of one death in every 11.5 returned with cause unknown. This county is the only large division of the State that has ever, in any year, reported the cause of every death within the county limits.

It will be seen that the proportion of unknown causes of death in 1879, was more than double that of 1878.

In Kent county, the smallest proportion of deaths reported from cause unknown, during seventeen years, was in 1871; that is, one in every 81.2, or about 1.2 per cent. The largest proportion was in 1868; that is, one in every 5, or 20 per cent. The proportion is larger for the last two years than for 1877.

Newport county, including the city of Newport, shows a general average of one death from cause unknown to every 12.4 of the decedents, or about 8 per cent. In the city of Newport, in 1878, the proportion was about 14 per cent.; while in the towns of Newport county it was only about 2.6 per cent. In 1879 there was less disparity of proportion between the city and county towns, but the proportion in the city was in that year more than twice as large.

The towns in Providence county have always shown a large number of deaths returned with cause unknown. The proportions have invariably been large, and therefore have varied less than any other division. The smallest proportion was in 1874; that is, about six per cent.; and the largest in 1868, which was about 20 per cent.

Providence city is a very good example of what may be accomplished by a "burial permit" law, properly enforced. During a period of seventeen years, the largest proportion of deaths returned with cause unknown, was one in every 45.0 in 1866, and the smallest, one in every 323 in 1877.

In Washington county, the proportion of deaths from cause not known was the largest in 1879 of any one of sixteen previous years, that is, one in every 8.6 decedents, or nearly twelve per cent.

The proportion was also larger in the whole State, that is, one in every 17.6 decedents, or about 6 per cent.

#### PRINCIPAL CAUSES OF DEATH.

The following Table gives the number of deaths in Rhode Island, from each of thirteen principal causes, showing the order in regard to number, in each of the last three years, and also in the aggregate of deaths for twenty-four years and seven months, from June 1st, 1852, to December 31st, 1876:

TABLE XLVIII.

*Showing the order in regard to number of Decedents from thirteen principal causes of death.*

1879.	1878.	1877.	June 1st, 1852, to Dec. 31st, 1876—24 yrs. 7 mos.
Whole Number.... 4,472	Whole Number.... 4,441	Whole Number.... 4,450	Whole Number.... 72,949
Consumption..... 637	Consumption..... 676	Consumption..... 661	Consumption..... 11,966
Pneumonia and Conges. of Lungs 311	Diphtheria .. . . . 435	Diphtheria..... 492	Pneumonia and Conges. of Lungs 4,310
Scarlatina..... 311	Pneumonia and Conges. of Lungs 317	Cholera Infantum . 259	Old Age..... 3,960
Diphtheria..... 259	Old Age .. . . . 222	Pneumonia and Conges. of Lungs 226	Cholera Infantum.. 3,743
Apoplexy and Paralysis..... 220	Cholera Infantum . 166	Old Age..... 213	Scarlatina.... 3,398
Old Age .. . . . 220	Heart, Diseases of. 166	Heart, Diseases of. 182	Fevers, Typhoid, &c..... 2,818
Heart, Diseases of. 202	Fevers, Typhoid, &c..... 150	Apoplexy and Paralysis..... 181	Heart, Diseases of. 2,647
Cholera Infantum . 161	Accidents (all kinds)..... 122	Cancer (all kinds).. 135	Apoplexy and Paralysis.... 2,398
Cancer (all kinds).. 126	Cancer (all kinds).. 119	Fevers, Typhoid, &c..... 134	Accidents (all kinds) .. . . . 2,217
Fevers, Typhoid, &c..... 123	Convulsions and Fits..... 112	Accidents (all kinds)..... 132	Dysentery..... 1,975
Convulsions, &c... 104	Apoplexy and Paralysis..... 102	Croup..... 96	Convulsions and Fits..... 1,559
Accidents..... 102	Croup..... 93	Convulsions and Fits..... 83	Croup..... 1,485
Croup..... 96	Scarlatina..... 96	Scarlatina..... 63	Diphtheria..... 1,291

Consumption, the arch destroyer of human life, leads, as in all previous years, in the number of its victims. In 1879 it caused an excess of more than 200 per cent. as many deaths as any other single disease.

Scarlatina, which during the two preceding years took the lowest place in the order of number of deaths, rises to the second place in 1879, in conjunction with Pneumonia.

This disease assumed a highly epidemic form in the city of Providence, and in some sections in the immediate vicinity, during the last four months of the year. More than 80 per cent. of all the deaths in the State from Scarlet Fever occurred in the city.

Diphtheria was second in point of number of victims in 1877 and in 1878, but in 1879 takes fourth place.

Diphtheria, in this Report, as will be seen above, is for the first time introduced in the column of order of largest mortality for the long series of years. It now outnumbers hydrocephalus, which it displaces, by several hundreds, and although only beginning to be reported in 1858, was, at the close of the year 1876, in advance of that disease as a cause of death, in the aggregate, by more than 20 per cent.

Cholera infantum, which had until within the last two years taken a prominent position in the yearly columns, and the fourth place in the long period of twenty-four years, is now, in the column for 1879, eighth in order of rank as a cause of death. The unusual exemption from Cholera infantum, during 1878 and 1879, of nearly every town in the State where it had most largely prevailed, has been commented upon on a previous page.

Pneumonia has been unusually fatal during the last two years, and maintains its old distinctive prominence as a leading destroyer of life.

Apoplexy and paralysis, also, were attended with unusual fatality during 1879, and stand fifth on the list.

Diseases of the Heart have largely increased, though not standing any higher in the order of largest number of decedents, but maintaining a steady prominence as a cause of death.

Cancer, in its various forms, is steadily increasing in prominence, and will probably be added to the column of the long period by another year.

Accidents have decreased, and Croup has varied but little in the number of its decedents for several years.

TABLE XLIX.

*Showing the Deaths in Rhode Island, in 1879, from Sixteen Principal Causes.*

	Accidents.	Apoplexy and Paralysis.	Brain, Diseases of.	Cancer.	Cholera Infantum.	Consumption.	Croup.	Diarrhoea.	Diphtheria.	Dysentery.	Fevers, Typhoid, &c.	Heart, Diseases of.	Whooping Cough.	Old Age.	Pneumonia and Congestion of Lungs.	Scarlatina.
Whole Number.....	102	220	157	125	161	637	96	53	259	44	114	202	43	220	311	311
PAR'AGE.																
SEX.																
{ Males.....	74	114	80	39	88	286	58	28	121	20	47	114	17	82	148	164
{ Females.....	28	106	77	86	73	351	38	25	138	24	67	88	26	138	163	147
{ American.....	44	146	82	70	71	278	40	22	143	25	63	127	22	152	163	130
{ Foreign.....	58	74	75	55	90	359	56	31	116	19	51	75	21	68	148	181
SEASON.																
{ January.....	9	19	17	9	...	70	15	2	20	1	7	19	4	40	84	15
{ February.....	5	17	14	7	1	55	13	1	17	...	7	18	3	21	30	15
{ March.....	10	12	21	13	2	68	15	2	20	...	10	16	3	18	38	12
{ April.....	6	27	11	5	1	49	7	2	26	4	5	25	5	18	28	14
{ May.....	7	21	15	15	1	47	5	2	14	...	10	18	5	13	24	14
{ June.....	9	16	8	11	3	36	7	4	23	3	12	10	6	13	12	5
{ July.....	11	19	8	11	47	46	1	13	12	10	10	14	3	13	5	7
{ August.....	8	18	12	12	72	64	1	13	16	15	9	16	4	21	8	14
{ September.....	7	24	6	7	25	45	4	8	21	5	12	10	...	19	15	23
{ October.....	6	14	17	10	9	61	12	...	40	3	15	18	3	15	20	39
{ November.....	13	11	12	13	...	49	10	4	31	3	7	22	4	16	18	65
{ December.....	11	22	16	12	...	47	6	2	19	...	10	16	3	13	29	88

TABLE XLIX.

*Showing the Deaths in Rhode Island, in 1879, from Sixteen Principal Causes.*

	Accidents.	Apoplexy and Paralysis.	Brain, Diseases of.	Cancer.	Cholera Infantum.	Consumption.	Croup.	Diarrhoea.	Diphtheria.	Dysentery.	Revers, Typhoid, &c.	Heart, Diseases of.	Hoopling Cough.	Old Age.	Pneumonia and Congestion of Lungs.	Scarlatina.
Ages.	Under 5 years.....	23	1	70	159	22	86	36	172	20	6	4	39	...	102	186
	5 and under 10....	10	2	16	2	5	9	...	63	1	13	7	3	...	8	99
	10 " " 15.....	2	...	4	...	17	1	...	11	...	7	4	...	...	1	16
	15 " " 20.....	3	...	...	...	62	...	...	7	...	14	4	...	...	...	...
	20 " " 30.....	9	6	...	...	186	...	...	2	4	26	9	1	...	...	4
	30 " " 40.....	15	11	11	...	119	...	2	1	2	15	13	...	...	14	2
	40 " " 50.....	8	18	7	...	81	...	2	1	1	6	25	...	...	27	2
	50 " " 60.....	6	27	10	...	68	...	4	2	2	3	33	...	...	26	...
	60 " " 70.....	8	57	14	...	45	...	5	...	6	12	51	...	...	35	1
	70 " " 80.....	7	59	18	...	24	...	4	...	4	8	36	...	...	38	...
	80 and over.....	5	38	4	...	5	...	...	...	2	3	16	...	...	151	...
	Not stated.....	1	...	1	...	3	...	...	...	1	1	...	...	...	19	...
LOCALITY.	Bristol County.....	2	12	3	8	16	3	1	7	8	4	8	...	14	7	3
	Kent County.....	9	9	13	16	38	6	3	19	3	13	20	11	19	15	6
	Newport Co., Towns	5	10	4	6	10	...	1	2	4	4	4	...	8	4	3
	Newport City.....	6	19	11	15	35	15	2	18	3	2	12	1	18	11	1
	Prov. Co., Towns...	23	71	50	51	197	25	14	95	13	44	38	12	71	103	37
	Providence City...	53	89	75	59	243	43	32	106	10	40	111	15	67	156	255
	Washington Co.....	4	10	1	9	48	4	...	12	3	7	9	4	25	15	6

## COMMENTS.

In commenting upon the various principal causes of death in Rhode Island in 1879; the same order will be followed as presented in the foregoing Table.

## DEATHS FROM ACCIDENTS.

The number of deaths resulting from accidents of all kinds in 1879, was 102. This number is 20 less than in 1878, and 30 less than in 1877.

Of these 102 deaths, 13 were from burns and scalds; 22 by drowning; 16 from falls; 5 from poisoning; 10 from railroad accidents, and 36 from various accidents too numerous to specify.

Of the whole number of deaths by accidents, 74 were males, and 28 were females; 44 were of American, and 58 were of foreign parentage.

It will be noticed how much larger the proportion of males is than that of females; that is, 73 per cent. of male decedents to 27 per cent. of female decedents. Of parentage, 57 per cent. was of foreign, and 43 per cent. of American.

The number of deaths in each quarter of the year was as follows:

First Quarter.....	24	Second Quarter.....	22
Third Quarter.....	26	Fourth Quarter.....	30
Total.....	102		

In regard to periods of life, the decedents from accidental causes were divided as follows: Under 5 years, 23; 5 and under 10, 10; between 10 and 20, 10; between 20 and 40, 24; between 40 and 60, 14; over 60, 20; and one, age not stated.

Of the whole number of deaths resulting from accidents, 53, or more than one-half, occurred in the city of Providence.

In the towns of Providence county, there were 23 deaths from accidental causes.

In regard to population the proportions are as follows:

From Accidents.	
City of Providence.....	One in every 2,000 of the population.
Towns of Providence County .....	One in every 4,000 of the population.

## APOPLEXY AND PARALYSIS.

There were 220 deaths from apoplexy and paralysis reported in Rhode Island in 1879, which were 32 more than in 1878, and 39 more than in 1877.

The following Table will give a synopsis of the several relations of these causes for the last fifteen years:

TABLE I.

*Showing the whole number and percentage of the Deaths in the State, from Apoplexy and Paralysis combined; and also the Sex and Parentage of the Decedents from these causes, and the number of the same in each of the Counties, from 1865 to 1879, inclusive.*

YEARS.	Whole Number of Deaths.	APOPLEXY AND PARALYSIS.											
		Number from Apoplexy and Paralysis.	Per cent.	SEX.		PARENTAGE.		DIVISIONS OF THE STATE.					
				Males.	Females.	American.	Foreign.	Bristol County.	Kent County.	Newport County.	Providence County, Towns.	Providence City.	Washington County.
1865.....	3,406	100	2.93	52	48	81	19	9	8	14	23	38	8
1866.....	2,970	92	3.09	46	46	80	12	8	5	17	24	29	9
1867.....	2,889	124	4.29	59	65	101	23	9	9	13	35	49	9
1868.....	2,912	111	3.81	56	55	86	25	9	6	19	27	46	4
1869.....	3,382	117	3.46	55	62	92	25	12	13	18	20	48	6
1870.....	3,228	180	4.32	68	62	105	25	14	10	10	39	52	5
1871.....	3,344	156	4.66	73	83	113	43	10	17	15	40	61	13
1872.....	4,247	125	2.97	62	63	96	29	17	9	10	27	52	10
1873.....	4,408	134	3.04	59	75	109	25	9	8	17	26	57	17
1874.....	4,229	156	3.69	84	72	120	36	14	10	16	42	59	15
1875.....	4,317	166	3.61	79	87	133	33	7	13	17	46	75	8
1876.....	4,116	165	4.01	79	86	130	35	13	11	13	45	68	1
1877.....	4,450	181	4.07	87	94	123	58	10	10	16	52	74	19
1878.....	4,441	188	4.23	104	84	145	43	12	16	21	58	66	15
1879.....	4,472	220	4.92	114	106	146	74	12	9	29	71	89	10
Total.....	56,815	2,165	3.81	1,059	1,088	1,660	505	165	154	245	575	863	163

Apoplexy and paralysis, as causes of death, have gradually increased during the last eight years, not only in number of decedents, but also in the proportion of the same to the whole number of decedents from all causes. The number and percentage during 1879 were larger than in any preceding year. The increase, as will be seen in the above Table, is not nearly so great in the American as in the foreign parentage. The average annual number of decedents, in the State, from apoplexy and paralysis, for twelve years previous to 1877, of foreign



parentage, was 27.5; the average annual number during the last three years, was 58, more than double that of the longer term of years.

TABLE LI.

*Showing the ages of Decedents from Apoplexy and Paralysis in each of the last fifteen years.*

APOPLEXY AND PARALYSIS.	PERIODS OF LIFE.							
	Under 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 and over.
1865.....		3	5	6	19	20	28	19
1866.....	1	1	7	16	9	24	27	7
1867.....	2		6	6	15	38	40	17
1868.....	2	3	3	11	16	27	31	16
1869.....	1	1	5	12	20	28	34	15
1870.....	4	1	10	9	12	33	41	20
1871.....	3	4	7	14	21	46	45	15
1872.....	1	4	5	17	20	26	41	11
1873.....	2	3	4	14	22	35	37	16
1874.....	1	2	9	9	30	39	40	25
1875.....	6	2	8	19	23	40	45	22
1876.....	4	4	4	18	25	43	49	23
1877.....	1	2	9	12	24	50	61	22
1878.....	4	2	7	14	41	40	53	26
1879.....	4	6	11	18	27	57	59	38
Total.....	36	38	100	190	324	546	690	292

It should be stated in connection with the above Table, that no cases of apoplexy were reported under twenty-years of age. Nor are such cases expected under that age. Paralysis in the earlier years of life occasionally occurs from various causes, not apoplectic, and as paralysis and apoplexy are taken together, the distinction between the two in the Table is lost. Apoplexy is eminently a disease of the later years of life. Nearly 83 per cent. of all cases affect persons of 50 years of age and over.

## BRAIN, DISEASES OF.

In Table XLIX., under the head of "Diseases of the Brain," are included all those reported as "Cerebral Meningitis," "Cerebritis," "Congestion," "Inflammation," and "Diseases of the Brain."

The number of decedents from these several causes, grouped under the head of "Diseases of the Brain," in 1879, was 157, which was 18 more than in 1878, and the same as in 1877. The proportion to the whole number of deaths from given causes, was 3.73 per cent. Of the 157 decedents, 80 were males, and 77 were females; 82 were of American parentage, and 75 of foreign parentage.

The deaths in the different seasons of the year were as follows:

First Quarter.....	52	Second Quarter.....	34
Third Quarter.....	26	Fourth Quarter.....	45
Total.....		157	

In relation to the periods of life, 70 of the deaths were of children under 5 years of age, or more than 44.5 per cent. of the whole.

## CANCER.

The number of deaths reported as having been caused by cancer, in 1879, was 125. This number is 6 more than in 1878; 10 less than in 1877, and is nearly 2.96 per cent. of the whole of the known causes of death in 1879.

As in the preceding topic the several varieties are grouped under one head.

In Tables VIII. and IX., pages 16 and 22, they are reported as follows: Cancer, various, 70; of the breast, 10; of stomach, 24; of the uterus, 21.

Of the whole number of decedents (125) 39 were males and 86 were females; 70 were of American, and 55 were of foreign parentage.

The large proportional number of females, nearly 60.0 per cent., the same as in 1878, though not so large as in 1877, when it was 78.52 per cent., is still indicative of the greater liability of the female sex to this dread disease. Cancer of the breast, in females, and cancer of the uterus, constitute nearly 25.0 per cent. of the whole number.

If season has any influence on mortality from cancer, it is from extremes of heat and cold, acting upon an exhausted organism.

In 1879, the deaths from cancer, in the several seasons of the year, were as follows:

First Quarter.....	29	Second Quarter.....	31
Third Quarter.....	30	Fourth Quarter.....	35
Total.....		125	

It will be seen that the season had very little influence on mortality from cancer, in 1879.

Cancer is eminently a disease of adult age. In 1879 there were two cases only, reported under 30 years of age, and twelve only, between 30 and 40.

In regard to locality, there was a considerable difference in 1879, especially in proportion to population. Bristol county, with a population of 11,395, had 9 decedents from cancer, or one in every 1,265, while Kent county, with 20,592 persons, had only 6, or one in every 3,432.

#### CHILD-BIRTH.

Under the head of child-birth as a cause of disease, are included diseases that have some necessary connection therewith, as puerpural convulsions and puerpural fever.

The number reported in 1879, was 43; 26 of which were from the immediate effects of child-birth alone; 8 from puerpural convulsions, and 9 from puerpural fever.

Of the 26 decedents from the immediate effects of child-birth, 12 were of American, and 14 were of foreign parentage; of the 8 from puerpural convulsions, 4 were of American, and 4 of foreign parentage; of the 9 from puerpural fever, 5 were of American, and 4 of foreign parentage.

Of the whole number, 21 were of American, and 22 of foreign parentage.

In the different seasons of the year they occurred as follows:

First Quarter.....	11	Second Quarter.....	15
Third Quarter.....	10	Fourth Quarter.....	17

Of the decedents, 3 were under 20 years of age, 21 between 20 and 30, 14 between 30 and 40, and the remaining 5 over 40 years of age.

#### CHOLERA INFANTUM.

There were reported in Rhode Island, in 1879, 161 deaths from cholera infantum. This number is 7 less than in 1878, and 98 less than in 1877. It is also less, notwithstanding the increase of population, than in any year since 1869.

Deaths from cholera infantum have gradually decreased in number and percentage for several years.

Dysentery and diarrhœa also, have prevailed less extensively during the last two or three years.

The percentage of deaths from cholera infantum, in 1879, was 3.82, as against 6.08, in 1877.

Of the 161 decedents, 88 were males and 73 females; 71 were of American, and 90 of foreign parentage; 133 were under the age of one year, 21 were between 1 and 2 years of age, and 5 were between 2 and 5.

In regard to season, one death was reported in February, 2 in March, one in April, one in May, 3 in June, 144, or about 89.4 per cent., in the months of July, August and September, and 9 during the rest of the year.

The deaths from cholera infantum were more equally distributed, in 1879, than in previous years, Washington county showing the greatest exemption, that is, one decedent to every 3,751 of the population. The proportion is larger in Washington county than in 1878.

The following Table shows the whole number of reported deaths from cholera infantum; the sex and parentage of the decedents, in each of the larger divisions of the State, in each of the last fifteen years:

TABLE LII.

YEARS.	CHOLERA INFANTUM.										
	Number of Deaths.	SEX.		PARENTAGE.		DIVISIONS OF THE STATE.					
		Males.	Females.	American.	Foreign.	Bristol County.	Kent County.	Newport County.	Providence County, Towns.	Providence City.	Washington County.
1865.....	145	68	82	61	84	17	7	14	48	50	9
1866.....	110	67	43	50	60	1	7	8	39	47	8
1867.....	117	64	53	62	55	4	3	7	45	49	9
1868.....	154	85	69	66	88	13	4	12	44	70	11
1869.....	151	81	70	79	72	6	15	6	48	65	11
1870.....	213	106	107	96	118	15	15	13	69	93	8
1871.....	172	85	87	82	90	14	12	12	59	62	13
1872.....	391	195	196	167	224	16	16	21	157	151	30
1873.....	285	148	137	165	120	17	14	16	120	99	19
1874.....	265	140	125	115	150	4	12	5	94	134	26
1875.....	318	156	162	155	163	20	16	20	106	136	18
1876.....	250	131	119	105	145	5	12	29	68	124	12
1877.....	259	139	120	96	163	12	13	9	96	122	7
1878.....	168	96	72	73	95	7	14	7	64	71	5
1879.....	161	88	73	71	90	8	16	21	51	59	6
Total, 15 years.....	3,159	1,644	1,515	1,442	1,717	159	176	200	1,100	1,332	192

During the last fifteen years there have been reported in Rhode Island, 3,159 decedents from cholera infantum, of which 1,644 were males, and 1,515 were females; or 108.5 males to each 100 females; or 52.3 males and 47.7 females in each 100 decedents.

Of the whole number, 1,442 were of American, and 1,717 were of foreign parentage; or 45.64 per cent. American, and 54.36 per cent. foreign parentage; or 119.21 decedents of foreign to each 100 of American parentage.

#### CONSUMPTION.

There were reported in Rhode Island, in 1879, 637 decedents from consumption. This number is smaller by 39 than in 1878, and smaller than during any one of the four previous years.

The number reported in 1878, 676, was the largest ever reported in the State, although the proportion to the whole number of decedents from all named causes, that is, 15.98 per cent., was smaller than the average of nineteen years, inclusive of 1878, which was 16.96 per cent.

The proportion of deaths from consumption in 1879, in relation to all known causes of death, was 15.10 per cent. This is smaller, as will be noticed, by nearly two per cent., than the average of the previous nineteen years.

Of the 637 decedents from consumption, the sex and parentage were as follows: In regard to sex, 286 were males, and 351 were females; the proportion standing 44.88 males, and 55.12 females in each 100; or 122.7 females to each 100 males.

In regard to parentage, 278 were of American, and 359 of foreign parentage; the proportions, 43.64 American, and 56.36 foreign, in each 100; or 129.14 foreign to each 100 of American parentage.

In regard to season, the largest number of deaths occurred in the first quarterly division of the year, and the smallest number in the second, as will be seen by the following summary:

First Quarter.....	198	Second Quarter.....	132
Third Quarter.....	155	Fourth Quarter.....	157

The largest number in any one month was 70, in January; the next largest, 68, in the month of March. In a series of years, the month of May stands first in the order of greatest mortality from consumption.

In May, 1879, there was the unusually small number of 47, and in June only 36, the smallest mortality from consumption of any month in the year.

Consumption is confined to no period of life, but the greatest mortality is found in the most active period of adult age; that is, from 20 to 40.

For instance, in 1879, of the 637 decedents from consumption, 186, or about 29.3 per cent., were between 20 and 30 years of age, and 119, or 18.7 per cent., between 30 and 40, making 48 per cent., or nearly half the whole number of decedents. This proportion is less than that of 1878, which was about 53.0 per cent., or more than half.

The relation of mortality from consumption to age, may be seen very readily in the following synopsis:

Age in periods of years.	No. Decedents.
Under ten.....	27
Between ten and twenty.....	79
Between twenty and thirty.....	186
Between thirty and forty.....	119
Between forty and fifty.....	81
Between fifty and sixty.....	68
Between sixty and seventy.....	45
Seventy and over.....	82
Total.....	687

The distribution of mortality from consumption, in the different sections of the State, is very unequal, not only in the percentage to the whole number of deaths in each section, but also in proportion to the population.

The largest percentage of mortality from consumption, to total given causes of death, in 1879, was in Washington county; that is, 21.83 per cent.; the smallest, in Newport county towns, about eleven per cent.

The subject of proportions will be taken up again, in remarks on Table LIII.

The following Table shows the total deaths from all reported *known causes*, with the number and percentage of deaths from consumption, in each of the larger divisions of the State, and in the whole State, in each of the last sixteen years, and in the aggregate for a period of twenty years, from 1860 to 1879, inclusive:

TABLE LIII.—CONSUMPTION.—*Number and Percentage.*

COUNTIES.	1864.	1865.	1866.	1867.	1868.	1869.	1870.	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	Total 30 years. 1860-1879.
<b>BRISTOL COUNTY.</b>																	
Total Deaths.....	168	190	162	144	129	165	146	150	184	173	159	162	148	201	187	141	3,144
Consumption.....	20	20	31	18	21	26	26	16	23	16	18	21	19	27	23	16	423
Percentage.....	11.90	10.52	19.13	12.50	16.28	15.76	17.81	10.67	12.50	9.24	11.32	12.97	12.83	13.43	12.30	11.35	18.45
<b>KENT COUNTY.</b>																	
Total Deaths.....	255	238	198	214	168	265	238	281	248	241	252	263	209	251	249	277	4,761
Consumption.....	46	41	41	56	38	50	46	63	33	42	32	43	28	42	41	38	870
Percentage.....	18.04	17.22	20.70	26.17	22.62	18.86	19.33	22.42	13.30	17.43	12.69	16.35	13.39	16.73	16.47	13.72	18.28
<b>NEWPORT COUNTY.</b>																	
Total Deaths.....	372	336	342	302	239	259	271	214	262	366	221	277	280	243	265	330	6,017
Consumption.....	48	51	52	47	43	40	37	23	29	44	26	41	45	33	31	45	857
Percentage.....	12.90	15.15	15.18	15.56	14.86	15.44	13.66	10.75	11.06	12.02	11.77	14.80	16.07	13.58	11.69	13.64	14.24
<b>PROVIDENCE Co., TOWNS.</b>																	
Total Deaths.....	870	990	863	902	779	912	964	989	1,331	1,369	1,217	1,230	1,110	1,891	1,308	1,233	30,385
Consumption.....	146	190	171	210	168	180	172	195	231	197	139	201	211	222	229	197	8,061
Percentage.....	16.78	19.19	19.36	23.28	20.29	19.74	17.84	19.72	16.73	14.18	11.42	16.84	19.01	15.96	17.51	15.98	17.95

TABLE LIII.—CONSUMPTION.—Number and Percentage.—Continued.

	1864.	1865.	1866.	1867.	1868.	1869.	1870.	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	Total 20 years. 1860-1879.
<b>COUNTIES.</b>																	
<b>PROVIDENCE CITY.</b>																	
Total Deaths.....	1,253	1,189	1,018	945	1,086	1,240	1,249	1,239	1,581	1,725	1,965	1,894	1,850	1,932	1,973	2,017	28,194
Consumption.....	197	191	200	189	214	210	238	195	242	230	270	297	284	294	305	293	4,649
Percentage.....	15.72	16.06	19.74	20.00	19.71	16.95	19.06	15.74	15.31	13.33	13.74	15.68	15.35	15.22	15.46	14.53	16.49
<b>WASHINGTON COUNTY.</b>																	
Total Deaths.....	233	255	201	187	173	241	233	222	265	292	268	284	306	240	249	220	4,513
Consumption.....	41	54	28	39	38	43	56	35	49	51	44	47	68	43	47	48	961
Percentage.....	17.51	21.16	13.93	20.86	21.96	17.84	24.04	15.76	18.49	17.47	16.73	16.55	22.22	17.91	18.88	21.82	19.08
<b>WHOLE STATE.</b>																	
Total Deaths.....	3,151	3,198	2,799	2,694	2,624	3,082	3,101	3,095	3,871	4,186	4,077	4,110	3,903	4,258	4,231	4,218	67,214
Consumption.....	498	547	523	559	512	549	575	527	597	580	529	650	655	661	676	637	11,321
Percentage.....	15.81	16.95	18.68	20.74	19.51	17.81	18.52	17.03	15.41	13.86	12.96	15.79	16.78	15.52	15.98	15.10	16.84



Persons interested in the statistics of diseases, and desiring to study consumption, will find Table LIII. very satisfactory in the facts it discloses in regard to number and locality of decedents, and relative proportions.

By arranging in parallel columns the items of single years, and combining together a long series of years, the results of single years can be readily compared, and the averages of a long period conclusively ascertained.

The variations of one year with another in the same locality, and of different localities in the same year, and the averages for a considerable number of years, are shown in such manner as to allow very definite conclusions.

In Bristol county, the annual percentages of mortality from consumption, to total deaths in the same county, have varied from 9.24 per cent. in 1873, to 17.81 per cent. in 1870.

The percentage of 1879 is 11.35, which is less than any one of the previous four years. The average of twenty years is 13.45 per cent., and is the smallest of any county.

Kent county shows a variation of from 12.69 per cent. in 1874, to 26.17 per cent. in 1867. The high percentage of mortality in that county in 1867, was not from the small number of deaths from other causes, but from the remarkably increased number of consumptives. In 1879, the percentage was 13.72, scarcely above half that of 1867. The mean average percentage of the long period is 18.28, the largest, with one exception, of any county in the State.

Following close upon the low average percentage of the twenty year period of Bristol county, we find Newport county with a mean of 14.24 per cent., or about four-fifths of one per cent. larger.

The variations in the annual percentages of Newport county, as seen in the foregoing Table, are from 10.75 per cent. in 1871, to 16.07 per cent. in 1876. The percentage of 1879 is 13.64.

Providence county towns show variations from 11.42 per cent. in 1874, to 23.28 per cent. in 1867, as may be seen in the Table. In 1862, there was in the towns of Providence county the high rate of 24.78 per cent., the largest on record for that county. In the same year the percentage of the whole State was 21.22, also the largest on record.

The percentage of consumption to total given causes of mortality in Providence county towns, in 1879, was 15.98; for twenty years, 1860 to 1879, inclusive, the average was 17.95 per cent.; or about two per cent. higher than the rate of 1879.

In Providence city, the proportion of deaths from consumption to total deaths, was 14.53 per cent. The rate is not only less in the city than in the country towns of Providence county, in 1879, but also in nearly every year of registration.

It may be regarded as a rule, that all the diseases of the *respiratory* organs have a larger percentage of mortality in the country towns of Providence county than in the city. But in the city there is usually a much larger percentage of deaths from other diseases, especially of the brain and nervous system, the heart, digestive organs, and alimentary canal. The proportion of deaths from all diseases, in 1879, to population by Census of 1880, was 14.8 in each one thousand in Providence county towns; and 19.3 in each thousand in Providence city.

Washington county has almost invariably shown a large percentage of mortality from consumption. The average percentage for a term of years, is larger than any other section of the State. The smallest percentage during the last sixteen years was recorded in 1866, that is, 13.93; the largest in 1870, which was 24.04 per cent.

The average mortality of twenty years is 19.08 per cent.; and of 1879, 21.82 per cent.

The smaller proportional number of deaths from other diseases, makes the percentage of deaths from consumption larger. For instance, in 1879, the proportion of deaths from all diseases to population, in Washington county, was 11.1 in each one thousand; in Providence county, 17.2 in each thousand.

It will be understood, that many circumstances may vary the percentage of deaths from consumption in any section, that is, the percentage of the whole number of deaths. An unusual mortality in any year from the prevalence of epidemics or endemics, would lessen the percentage from consumption in that year, even if the number of decedents from consumption was the same, or even somewhat larger than in ordinary years.

The extremes of proportion in the whole State during the last sixteen years, as found in Table LIII., are 12.96 per cent. in 1874, and 20.74 per cent. in 1867. The percentage of 1879 is 15.10, and the average of twenty years 16.84.

In the Report of 1878 the whole number of deaths from consumption, in the last nineteen years, including 1878, in the different divisions of the State was compared with the number of inhabitants of the same divisions for the purpose of ascertaining the percentage of deaths from that cause in proportion to the population. If the population of all sections increased with equal ratio, such comparison would show the relative liability of the inhabitants of each section to the disease, with quite full accuracy. But as it is, an average of the semi-decennial enumerations may be taken, which will afford such an approximation to exactness as to make the comparisons sufficiently correct.

The following is the synopsis then presented:

## CONSUMPTION—PROPORTION OF DEATHS TO POPULATION.

1860-1878.

## NINETEEN YEARS, INCLUSIVE.

	Yearly average. No. of deaths.	Yearly average to population one in every	
Bristol County.....	21.4	442	or 2.26 in each 1,000
Kent County.....	43.8	408	or 2.48 in each 1,000
Newport County..	42.7	492	or 2.08 in each 1 000
Providence County, Towns.....	182.3	408	or 2.48 in each 1,000
Providence City.....	229.0	349	or 2.87 in each 1,000
Washington County.....	42.0	452	or 2.21 in each 1,000

It may be of interest also to compare the proportions of 1879 with those of 1878, as well as with the long period of nineteen years:

## CONSUMPTION—PROPORTION OF DEATHS TO POPULATION.

1878.

	Total Deaths.	To population one in every	
Bristol County.....	23	482	or 2.08 in each 1,000
Kent County.....	41	496	or 2.02 in each 1,000
Newport County.....	31	706	or 1.41 in each 1,000
Providence County, Towns.....	229	370	or 2.72 in each 1,000
Providence City.....	305	330	or 3.08 in each 1,000
Washington County.....	47	427	or 2.34 in each 1,000

1879.

	Total Deaths.	To population one in every	
Bristol County.....	16	712	or 1.40 in each 1,000
Kent County.....	38	542	or 1.84 in each 1,000
Newport County.....	45	538	or 1.86 in each 1,000
Providence County, Towns.....	197	473	or 2.11 in each 1,000
Providence City.....	293	358	or 2.80 in each 1,000
Washington County.....	48	470	or 2.13 in each 1,000

The proportions of 1879 are based on the Census of 1880.

It will be noticed that the mortality from consumption in 1879, in proportion to the population, was less in every division of the State

than the average of nineteen years, and that the proportion was also less in 1879 in every division, except Newport county, than in 1878.

It should be remembered, however, that the larger population upon which the calculations of 1879 are based would lessen the proportions; and, as in the case of Washington county, the ratio would be but little changed.

If we take the records of consumption for nineteen years as an indication of the liability of the inhabitants of the different sections to contract that formidable disease, then Newport county will stand first in the order of exemption.

Washington county follows Newport in the order of least liability, and the other divisions appear as follows, in order: Bristol county; Providence county towns, and Kent county having an equal liability; and Providence city; the last showing the greatest liability.

#### CROUP AND DIPHTHERIA.

Contrasts have been made between croup and diphtheria since 1858 for various purposes, as will be seen in the following pages. Although they have some pathological conditions in common, they are not generally believed to be identical.

The following Table shows the number of deaths and the sex of the decedents in Rhode Island, from croup and from diphtheria, in each of the seven years, from 1858 to 1864, inclusive:

TABLE LIV.

YEARS.	CROUP.			DIPHTHERIA.		
	Males.	Females.	Total.	Males.	Females.	Total.
1858 .....	35	34	69	1	5	6
1859 .....	37	21	58	10	10	20
1860 .....	27	30	57	24	43	67
1861 .....	32	26	58	66	74	140
1862 .....	34	39	73	31	50	81
1863 .....	51	46	97	73	82	155
1864 .....	48	57	105	67	93	160
Seven Years .....	264	253	517	272	357	629

Table LIV. has been retained in these reports to show the progress of diphtheria during the first seven years of its reported existence in

the State and its numerical relations to croup during that time, and also because the mode of tabulation of comparisons since that period, has included the parentage of decedents from these causes, and consequently a new form of Table.

The following Table gives the number, the sex and the *parentage*, of the decedents from croup and from diphtheria, in Rhode Island, in each of the last fifteen years, from 1865 to 1879, inclusive:

TABLE LV.

YEARS.	CROUP.					DIPHTHERIA.				
	Number of Deaths.	SEX.		PARENTAGE.		Number of Deaths.	SEX.		PARENTAGE.	
		Males.	Females.	American.	Foreign.		Males.	Females.	American.	Foreign.
1865.....	94	44	50	32	62	82	41	41	62	20
1866.....	53	26	27	22	31	64	26	38	36	28
1867.....	50	25	25	21	29	31	14	17	19	12
1868.....	30	13	17	14	16	20	8	12	11	9
1869.....	41	19	22	14	27	33	18	15	19	14
1870.....	53	29	24	25	28	33	17	16	18	15
1871.....	72	39	33	31	41	57	23	34	29	28
1872.....	66	37	29	17	49	48	24	24	35	13
1873.....	68	30	38	35	33	45	24	21	35	10
1874.....	65	39	26	38	27	59	30	29	37	22
1875.....	96	53	43	43	53	33	17	16	18	15
1876.....	102	50	52	42	60	159	77	82	69	90
1877.....	95	48	47	34	61	492	239	253	233	259
1878.....	98	45	48	43	50	435	224	211	201	234
1879.....	96	58	38	40	56	259	121	138	143	116
Total, 15 Years.....	1,074	555	519	451	623	1,850	908	947	965	885

By the two preceding Tables we may note the progress of diphtheria for twenty-two years. It had not assumed prominent importance as a cause of death until in 1861, when 140 deaths were reported as having been caused by it. It prevailed to a considerable extent in 1863 and 1864, and then subsided to a point in numbers considerably below that of croup, in the aggregate and in the average, for eleven years, or until 1876, when it again assumed large proportions. During 1877

and 1878 it prevailed to an alarming extent, and second only to consumption was the most prominent and formidable cause of death in the State.

During the last three years the deaths from croup number 284; the deaths from diphtheria 1,176, an excess of more than 400 per cent.

#### SEX AND PARENTAGE.

Of the whole number of decedents from croup in twenty-two years, 1858 to 1879, inclusive, 819 were males and 736 were females, or 111.3 males to each 100 females.

For the same period of time, of the whole number of decedents from diphtheria, 1,175 were males and 1,304 were females; or 89.1 males to each 100 females.

It will be seen that there is a very considerable difference in the proportion of the sexes of the decedents from the two diseases.

Why there should be such a preponderance of male decedents in croup, and so small a proportion of male decedents in diphtheria, may be a question of difficult solution.

It is possible that from the generally more vigorous physical stamina of males, croup fastens upon the patient with a more unrelaxing and fatal grasp, while the same greater vital power of the males enables them to endure longer and more successfully the prostrating effects of the diphtheritic poison.

During the year 1879, the decedents from croup were in large proportion of foreign parentage; that is, 140 of foreign to each 100 of American parentage.

On the other hand, the decedents from diphtheria were in large proportion of American parentage; that is, 123.3 of American to each 100 of foreign parentage.

The following summary will show in a concise form the percentage of deaths in the sexes from croup and diphtheria, and also the parentage of the same decedents in the fourteen years preceding 1879:

#### IN EACH 100 DECEDENTS.

1865-1878.

	Males.	Females.	Total.	American Parentage.	Foreign Parentage.	
Croup.....	50.82.....	49.18 .....	100.00...	42.02...	57.98.....	100.00
Diphtheria.....	49.15 .....	50.85.....	100.00.....	51.66.....	48.34.....	100.00

In regard to the parentage of the decedents during the fourteen years, it will be seen that although the foreign population in the State is considerably less than the American, the decedents from croup are

in large excess of foreign parentage, and the decedents from diphtheria are in excess of American parentage.

When, however, we consider the numerical proportions of the two classes of population, it will be found that there is a slight excess of *percentage* of mortality from diphtheria of foreign parentage.

#### SEASON AND MORTALITY.

The influence of season in regard to mortality from croup and diphtheria, may be seen in the following Table, where these diseases may also be compared with scarlatina, to which they bear resemblance in some respects. The Table will give the whole number of deaths, during the periods named, and the average monthly and quarterly percentages of deaths, from each disease:

TABLE LVI.

MONTHS.	CROUP. 1853-1879.		DIPHTHERIA. 1853-1879.		SCARLATINA. 1853-1879.	
	Number of Deaths.	Per cent.	Number of Deaths.	Per cent.	Number of Deaths.	Per cent.
January.....	228	12.88	221	9.13	416	11.06
February.....	199	10.83	160	6.62	398	10.61
March.....	160	8.67	183	7.57	367	9.78
First Quarter.....	587	31.88	564	23.32	1,181	31.47
April.....	130	7.06	134	5.54	306	8.16
May.....	94	5.11	154	6.36	331	8.79
June.....	90	4.89	157	6.49	315	8.39
Second Quarter.....	314	17.06	445	18.39	952	25.36
July.....	58	3.15	118	4.88	215	5.72
August.....	54	2.92	145	5.99	173	4.70
September.....	116	6.31	216	8.93	179	4.70
Third Quarter.....	228	12.38	479	19.80	567	15.12
October.....	198	10.76	324	13.39	250	6.66
November.....	242	13.15	322	13.32	337	8.98
December.....	272	14.77	285	11.78	466	12.41
Fourth Quarter.....	712	38.68	931	38.49	1,053	28.05
Totals.....	1,841	100.00	2,419	100.00	3,753	100.00

The facts disclosed in Table LVI., in relation to the influence of season on mortality from croup, diphtheria and scarlatina, afford a wide field for study to those interested in such statistics. It will be seen that the three diseases may be studied in their comparative, as well as absolute relation to season, that is, in comparison, each with the others.

It will be noticed that the statistics of diphtheria are for twenty-two years, commencing with 1858, as no reports of deaths from that disease had been returned previous to that year; and that the statistics of croup and scarlatina are for the period of twenty-seven years.

An examination of the Table will show that the average monthly percentages of mortality from croup, for a series of twenty-seven years, diminish in regular order from the month of January to the month of August, in which month we find the minimum of mortality, and then as regularly increases from month to month throughout the rest of the year, the largest average percentage being found in the months of November and December.

In diphtheria, there is a gradual diminution from the beginning of the year to July, but in a more irregular mode of gradation. From and including August, the percentages of mortality rapidly increases to the months of October and November, in which the percentage is about equal. There is then a change, the diminution commencing in December and ending in the July following.

In scarlatina, the percentage of mortality diminishes, almost as regularly as in croup, from the month of January to August and September, which months have an equal minimum percentage. From September there is a regular increase to December, in which month the maximum percentage is reached.

It will be observed that diphtheria reaches its minimum percentage of mortality a month earlier than croup, and from one to two months earlier than scarlatina. Its maximum is also reached a month or more earlier than either of the others.

It has been before remarked, that aside from the similarity of the three diseases, in the diminution of mortality and of prevalence also, as the months of the warmer season advance, there are decided differences in the relative percentages of the several quarterly and other divisions of the year.

The following summary will present very concisely the differences in the percentages of mortality from the different diseases, in each of the quarterly periods, and also in each of the periods of four and six months. It will be kept in mind that the percentages of diphtheria are for a period of five years less than either of the others, but it is hardly probable that a more extended period would materially change the results as to its own percentage of mortality in the different seasons:



## PERCENTAGES OF MORTALITY.

	First Quarter.	Second Quarter.	Third Quarter.	Fourth Quarter.	First 4 Months.	Second 4 Months.	Third 4 Months.	First 6 Months.	Second 6 Months.
Croup...	31.88	17.06	12.38	38.68	38.94	16.10	44.96	48.94	51.05
Diphtheria...	23.32	18.39	19.80	38.49	26.88	23.73	47.39	41.71	56.29
Scarlatina...	31.47	25.36	15.12	28.05	39.62	27.55	33.63	56.83	43.17

Whatever influence there may be in season, in regard to mortality from the diseases under consideration, and it is very evident that such influence does exist, the contrasts presented above will show very clearly how the three diseases are affected by it.

It will be noticed that in croup and diphtheria, the largest percentages of mortality were in the last quarter, the last third and last half of the year. But in scarlatina it will be seen it is quite the reverse, the percentages being very considerably larger in the first quarter, first third and first half of the year.

It may be of interest to some persons to see the contrasts, in a summarized form, of the proportions of deaths from diphtheria and scarlatina to all known causes of death, in each of the different divisions of the State, for each of the years 1877 to 1879, inclusive:

	DIPHTHERIA.			SCARLATINA.		
	1877. Per cent.	1878. Per cent.	1879. Per cent.	1877. Per cent.	1878. Per cent.	1879. Per cent.
Bristol County .....	5.97	11.23	4.96	6.97	1.60	2.13
Kent County.....	17.53	11.64	6.85	1.59	2.01	2.17
Newport County, Towns..	—	4.06	2.20	—	4.03	3.30
Newport City.....	1.19	10.47	7.54	1.78	—	.42
Providence Co., Towns....	8.77	8.11	7.71	1.51	1.07	3.00
Providence City.....	15.27	12.42	5.25	.62	2.89	12.64
Washington County.....	7.06	4.42	5.45	3.33	1.61	2.73
Whole State .....	11.56	10.28	6.14	1.46	2.03	7.87

The changes which have taken place within the last three years in the prevalence of diphtheria and scarlatina, in the different divisions of the State, are very clearly shown in the above synopsis. In 1877 no deaths from either of these diseases were reported from Newport county towns, and in Newport city, two only from diphtheria, and three from scarlatina.

In Newport city, in 1878, the mortality from diphtheria rose to more than a tenth of the whole number of decedents, and subsided in 1879 to about seven and one-half per cent.

In Providence city, as will be seen, the proportion of deaths from diphtheria in 1877 was more than a seventh of the whole number, diminishing in 1878 to less than one-eighth, and in 1879 to about one-twentieth.

Diphtheria prevailed very largely in Kent county in 1877, causing a mortality of more than one-sixth of the whole number of deaths, subsiding to about one-ninth in 1878, and about one-fifteenth in 1879.

In Providence county towns and Washington county, the proportions of deaths from diphtheria have not varied very much during the last three years.

In Bristol county there was a large mortality from diphtheria in 1878, more than one-ninth of the whole, and about twice as large as in the preceding, or the following year.

Scarlatina prevailed quite extensively, and was largely fatal, in Bristol county in 1877, subsiding to quite small proportions in 1878 and 1879. It seemed to pass into the towns of Newport county, where it was quite prevalent in 1878, and from thence to Providence city, where, in September of 1879, it assumed the proportions of a formidable epidemic, and continued such through the year. The mortality from scarlatina in the city of Providence, in 1879, was more than one-eighth of the whole.

It has been only slightly prevalent during the last three years in Kent county, in Newport city, and in Providence county towns. In the last named, it was confined mostly during 1879 to the towns lying immediately adjacent to Providence city.

In Washington county it has had moderate prevalence during the last three years.

The following Table will show the statistics of scarlatina for each of the last twenty-five years, from 1855 to 1879, inclusive; the whole number of deaths in the State; the number and percentage, and sex of the decedents from scarlatina, and the number from scarlatina in each division of the State. It will also show, from 1865 to 1879, inclusive, the parentage of the decedents from scarlatina:

TABLE LVII.

YEARS.	Whole Number of Deaths.	SCARLATINA.											
		Scarlatina.	Per cent.	SEX.		PARENTAGE.		DIVISIONS OF THE STATE.					
				Males.	Females.	American.	Foreign.	Bristol County.	Kent County.	Newport County.	Providence County, Towns.	Providence City.	Washington County.
1855.....	1,846	71	3.8	41	30	....	....	22	....	1	6	42	...
1856.....	2,042	206	10.2	109	99	....	....	3	1	3	57	144	....
1857.....	2,325	147	6.3	69	78	....	....	....	20	47	47	33	1
1858.....	2,616	234	8.9	118	116	....	....	5	11	75	61	72	10
1859.....	2,270	71	3.1	34	37	....	....	5	2	4	14	45	1
1860.....	2,686	64	2.4	31	33	....	....	4	3	7	17	17	16
1861.....	2,927	57	1.9	24	33	....	....	2	2	7	9	28	9
1862.....	2,591	47	1.8	25	22	....	....	3	4	3	19	14	4
1863.....	3,207	91	2.8	40	51	....	....	1	....	23	24	33	10
1864.....	3,360	266	8.0	130	146	....	....	1	19	19	80	141	6
1865.....	3,405	255	7.5	130	125	134	121	33	17	3	86	108	8
1866.....	2,970	28	0.9	15	13	12	16	5	...	8	12	3	....
1867.....	2,889	14	0.5	6	8	10	4	1	....	1	2	10	....
1868.....	2,912	93	3.2	47	46	32	61	2	3	3	34	50	1
1869.....	3,382	286	8.4	136	160	128	158	17	23	12	72	138	24
1870.....	3,238	75	2.3	37	38	28	47	1	6	3	22	35	8
1871.....	3,344	66	1.9	41	25	31	35	1	3	1	37	21	13
1872.....	4,247	53	1.2	22	31	22	31	....	1	4	27	19	2
1873.....	4,403	287	6.5	124	163	163	124	4	2	42	80	132	27
1874.....	4,229	462	10.9	231	231	176	286	27	17	1	133	268	16
1875.....	4,317	185	4.3	85	100	121	64	8	30	3	35	94	15
1876.....	4,116	80	1.9	34	46	42	38	3	2	7	21	55	12
1877.....	4,450	62	1.4	26	36	29	33	14	4	3	21	12	8
1878.....	4,441	86	1.9	41	45	35	51	3	5	3	14	57	4
1879.....	4,472	311	7.4	164	147	130	181	3	6	4	37	255	6
Totals, 24 Years.	82,685	3,599	4.3	1,740	1,859	1,093	1,250	168	181	287	957	1,805	201

## DISEASES OF THE HEART.

During the year 1879, there were reported in Rhode Island 202 deaths from diseases of the heart. This number is 36 larger than that of 1878, and 20 larger than in 1877. It is the largest number

ever reported with one exception, and is 4.78 per cent. of all deaths from given causes.

The following Table shows, for each of the last fifteen years, 1865 to 1879, inclusive, the whole number of deaths in the State; the number and percentage, and the sex and parentage of the decedents from diseases of the heart, and the number of the same in each division of the State:

TABLE LVIII.

YEARS.	Whole Number of Deaths.	DISEASES OF THE HEART.											
		Diseases of the Heart.	Per cent.	SEX.		PARENTAGE.		DIVISIONS OF THE STATE.					
				Males.	Females.	American.	Foreign.	Bristol County.	Kent County.	Newport County.	Providence County, Towns.	Providence City.	Washington County.
1865.....	3,405	96	2.88	51	47	65	33	6	5	8	27	47	5
1866.....	2,970	115	3.87	58	57	90	25	7	8	10	41	40	9
1867.....	2,889	114	3.94	67	47	81	33	4	9	7	37	49	8
1868.....	2,912	116	3.96	58	58	79	37	5	8	12	35	52	4
1869.....	3,382	123	3.78	75	53	79	49	2	13	11	36	63	4
1870.....	3,238	117	3.61	77	40	77	40	4	10	8	35	59	1
1871.....	3,344	144	4.30	78	66	91	53	4	7	8	42	77	6
1872.....	4,247	189	4.45	104	85	119	70	5	9	10	59	93	13
1873.....	4,408	189	4.29	83	106	122	67	4	11	14	48	101	11
1874.....	4,329	214	5.06	109	105	150	64	6	6	23	50	106	18
1875.....	4,317	186	4.31	84	102	118	73	2	13	23	49	88	12
1876.....	4,116	166	4.03	86	80	109	57	9	11	10	38	86	12
1877.....	4,450	182	4.09	94	88	110	73	3	7	9	57	93	13
1878.....	4,441	166	3.73	88	78	109	57	5	11	15	38	83	14
1879.....	4,472	202	4.73	114	88	127	75	8	20	16	38	111	9
Totals, 15 years..	56,815	2,326	4.09	1,226	1,100	1,521	805	74	143	173	630	1,147	139

The difference in the percentage of males and females, and also of American and foreign parentage, of the decedents from diseases of the heart is quite noteworthy.

Of the 2,326 persons deceased from diseases of the heart, in the last fifteen years, 1,226 were males, and 1,100 were females; or 52.71 males and 47.29 females in each 100; or 111.5 males to each 100 females.

The greatest difference, however, is found in the parentage.

Of the 2,326 decedents from this cause, 1,521 were of American and 805 were of foreign parentage; or 65.4 of American and 34.6 of foreign parentage in each 100; or 189 decedents of American parentage to each 100 of foreign.

The following Table shows the number of decedents from diseases of the heart, in each divisional period of life, in each of the last fifteen years:

TABLE LIX.

YEARS.	Under 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 and over.	Not stated.
1865.....	14	4	6	7	22	17	19	9	.....
1866.....	18	8	14	17	10	23	21	4	.....
1867.....	11	11	10	13	22	16	27	4	.....
1868.....	15	5	13	11	14	26	25	5	.....
1869.....	21	4	14	18	30	23	21	7	1
1870.....	19	6	11	13	30	21	23	3	1
1871.....	9	12	10	19	23	26	28	6	1
1872.....	27	12	23	19	31	26	29	13	.....
1873.....	19	11	28	18	25	35	43	9	2
1874.....	20	16	26	21	27	50	40	12	2
1875.....	14	16	25	30	32	29	41	9	.....
1876.....	14	10	15	19	20	28	39	10	1
1877.....	15	11	20	18	27	45	33	13	.....
1878.....	16	8	18	16	26	36	35	11	.....
1879.....	19	9	13	25	33	51	36	16	.....
Totals, 15 Years.....	251	143	245	264	352	463	459	131	8

It will be observed that a considerable proportion of deaths from diseases of the heart were of persons under twenty years of age. Contrary to the popular opinion, diseases of this class are frequently found in the earlier years of life. But such diseases, in persons under twenty years of age, are more amenable to treatment, and recoveries, more or less complete, are the rule rather than otherwise. In persons of middle age, and especially after attaining the age of fifty, the diseases have a more chronic character, and the recoveries are less in proportion.

More than one-third of the total deaths from diseases of the heart

occur in persons between fifty and seventy years of age, and considerably more than one-half between the ages of fifty and eighty.

#### PNEUMONIA AND CONGESTION OF THE LUNGS.

The following Table shows, for each of the last fifteen years, the whole number of deaths reported in Rhode Island; the number and the percentage, with the sex and the parentage of the decedents from pneumonia and congestion of the lungs, and the number in each year, in each division of the State:

TABLE LX.

YEARS.	Whole Number of Deaths.	PNEUMONIA AND CONGESTION OF THE LUNGS.											
		Pneumonia, &c.	Per cent.	SEX.		PARENTAGE.		DIVISIONS OF THE STATE.					
				Males.	Females.	American.	Foreign.	Bristol County.	Kent County.	Newport County.	Providence County, Towns.	Providence City.	Washington County.
1865.....	3,405	175	5.1	80	95	110	65	8	11	21	49	74	12
1866.....	2,970	193	6.5	94	99	127	66	13	17	13	59	81	10
1867.....	2,869	172	5.9	68	104	108	69	8	12	12	56	68	16
1868.....	2,912	191	6.6	99	92	120	71	9	5	16	54	92	15
1869.....	3,382	190	5.6	104	86	110	80	7	10	10	63	88	12
1870.....	3,228	182	5.6	102	80	96	86	6	12	15	55	78	16
1871.....	3,344	218	6.5	104	114	129	89	12	21	11	68	85	21
1872.....	4,247	229	5.4	119	110	125	104	11	1	9	74	120	14
1873.....	4,403	234	5.3	127	107	143	91	11	9	10	65	122	16
1874.....	4,229	250	5.9	118	132	143	107	6	13	7	73	126	15
1875.....	4,317	400	9.3	199	201	243	157	14	27	25	105	198	31
1876.....	4,116	389	8.2	164	175	162	177	13	23	16	97	163	27
1877.....	4,450	226	5.1	104	122	127	99	10	7	14	81	98	16
1878.....	4,441	317	7.1	143	174	176	141	10	11	18	110	140	28
1879.....	4,472	311	7.4	148	163	163	148	7	15	15	103	156	15
Totals, 15 Years.	56,815	3,627	6.4	1,773	1,854	2,077	1,550	145	194	212	1,112	1,700	264

Next to consumption, pneumonia and congestion of the lungs, in a long series of years, show the largest average mortality. In 1879, however, scarlatina was the cause of an equal number of deaths, and in an occasional year some other form of disease has shown an equal or larger mortality.

The number of deaths in Rhode Island in 1879, from pneumonia and congestion of the lungs, was 311, a decrease of 6 from that of 1878. The average of fifteen years is 242 annually; and the average annual percentage to total mortality from known causes for the same period is 6.4, while the percentage of 1879 is 7.4, a difference of one per cent.

There is usually a preponderance of females in the decedents from inflammation of the lungs, and in 1878 the excess was 121.7 females to each 100 males. In 1879 the excess of female decedents was 110 to each 100 males. For a period of fourteen years preceding 1879 the average proportion was 104 females to each 100 males; or 51 females and 49 males in each 100 decedents.

The proportions in regard to parentage are much more unequal than in regard to sex.

In 1879, of the 311 decedents from pneumonia and congestion of the lungs, 163 were of American and 148 of foreign parentage; or 110 American to each 100 foreign; or 52.4 decedents of American parentage and 47.6 decedents of foreign parentage in each 100.

The difference of percentage of mortality, between the two classes of American and foreign parentage, was much less in 1879 than usual. In a period of fourteen years preceding 1879 the proportions were 57.7 of American and 42.3 of foreign parentage in each 100 decedents; or 136.5 of American to each 100 of foreign parentage.

The following Table shows, for each of the last fifteen years, the number of decedents in Rhode Island, from pneumonia and congestion of the lungs, in each division of ages:

TABLE LVII.

YEARS.	Under 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 and over.	Not stated.
1865.....	65	4	2	...	14	11	15	17	21	21	5	...
1866.....	57	4	4	5	12	10	14	21	25	32	9	...
1867.....	57	9	2	3	10	11	13	16	25	18	12	1
1868.....	70	4	3	8	15	8	16	13	19	27	13	...
1869.....	64	11	1	2	11	12	9	28	25	16	11	...
1870.....	84	6	5	4	6	7	8	14	20	19	8	1
1871.....	71	7	2	7	10	17	16	16	35	17	19	1
1872.....	88	5	1	7	17	20	19	22	24	19	11	1
1873.....	105	4	8	3	10	14	16	17	24	23	10	...
1874.....	76	9	4	6	17	17	25	21	40	27	8	...
1875.....	120	9	3	8	22	30	35	39	61	43	28	2
1876.....	116	5	4	3	20	20	32	35	48	39	17	...
1877.....	79	2	...	7	15	15	24	27	22	24	9	2
1878.....	115	9	4	10	14	17	28	20	42	45	13	...
1879.....	102	8	1	3	14	27	26	35	38	38	19	...
Totals.....	1264	96	44	71	207	236	296	341	469	403	192	8

It will not fail to be noticed, upon examination of the above Table, how largely the mortality from pneumonia and congestion of the lungs is found in the very young, and in the latest periods of life. About one-third of the whole number of decedents in 1879 from these causes were of persons under five years of age, and nearly another third over sixty years of age, leaving a little more than the remaining third to be distributed through periods coverings fifty-five years, and those of the most vigorous years of life. Feebleness of body gives success to the destructive tendencies of the disease.

## TYPHOID FEVER.

The number of deaths in Rhode Island, in 1879, reported under the general title of "Fevers," was 114. This is 36 less than in 1878, and 20 less than in 1877. The number includes all reported under the following specific terms: "Gastric," 1; "Remittent," 2; "Typhoid or Typhus," 101; "Fever," 10. It is probable that nearly all fevers occurring in Rhode Island are essentially typhoid, the type being modified by a variety of circumstances. Of course the term is not



designed to cover all febrile states, dependent on malaria or a variety of acute and chronic inflammations.

The following Table shows, for each of the last fifteen years, the whole number of deaths in the State; the number and the percentage, and the sex and parentage of the decedents from fevers, and the number in each division of the State:

TABLE LXII. .

YEARS.	Whole Number of Deaths.	TYPHOID FEVER.											
		Typhoid Fever.	Per cent.	SEX.		PARENTAGE.		DIVISIONS OF THE STATE.					
				Males.	Females.	American.	Foreign.	Bristol County.	Kent County.	Newport County.	Providence County, Towns.	Providence City.	Washington County.
1865.....	3,406	229	6.4	114	115	149	80	8	17	22	83	79	21
1866.....	2,970	150	5.0	73	77	82	68	7	5	32	54	45	7
1867.....	2,889	119	4.1	60	59	84	35	9	10	17	47	31	5
1868.....	2,912	84	2.9	45	39	57	27	4	5	7	30	23	13
1869.....	3,382	101	3.0	58	48	79	22	7	7	1	37	33	16
1870.....	3,238	158	4.7	66	87	80	73	5	11	14	57	49	17
1871.....	3,344	125	3.7	60	65	69	56	2	8	10	41	51	13
1872.....	4,247	179	4.2	87	92	91	88	4	12	6	75	65	17
1873.....	4,408	172	3.9	73	99	113	59	4	9	9	61	56	33
1874.....	4,229	117	2.8	57	60	56	61	1	10	3	37	58	8
1875.....	4,317	147	3.4	73	74	90	57	1	4	6	49	69	18
1876.....	4,116	126	3.0	65	61	71	55	5	9	13	44	33	22
1877.....	4,450	134	3.0	63	71	65	69	8	10	8	52	44	12
1878.....	4,441	150	3.4	68	82	77	73	13	15	7	62	58	14
1879.....	4,472	114	2.7	47	67	63	51	4	13	6	44	40	7
Totals, 15 Years	56,815	2,100	3.07	1,004	1,096	1,226	874	82	145	161	773	734	225

The *percentage* of mortality from fevers in 1879 in proportion to all known causes of death was less than the average of fifteen years, and the *number of decedents* from that cause was less than in any year since 1869.

In regard to the sex of the decedents, there were 142.5 females to each 100 males; or 58.8 females and 41.2 males in each 100 decedents. This is a much larger disproportion than the average of a long term of years.

During the last fifteen years there were 1,004 male and 1,096 female decedents from fever; or 109 females to each 100 males; or 52.2 females and 47.8 males in each 100 decedents.

The difference in regard to the parentage of the decedents in 1879, was not so large as in the sex.

Of the 114 decedents from fever, 63 were of American, and 51 were of foreign parentage; or 123.5 American to each 100 of foreign; or 55.2 American and 44.8 foreign, in each 100 decedents.

The difference in 1879 is considerably less than the proportions of the aggregates of fifteen years.

The whole number of decedents during the last fifteen years from fever was 2,100, of which 1,226 were of American, and 874 were of foreign parentage.

There were then 140.2 American to each 100 foreign; or 58.4 of American and 41.6 of foreign parentage, in each 100 decedents.

The following Table shows the number of decedents from fevers, in each division of ages, in each of the last fifteen years, in the State of Rhode Island:

TABLE LXIII.

TYPHOID FEVER.		PERIODS OF LIFE.										
YEARS.		Under 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 and over.	Not stated.
1865.....		35	18	46	54	30	14	18	7	5	2	...
1866.....		23	10	21	26	21	16	9	14	10	....	...
1867.....		17	6	23	33	12	11	8	4	2	2	1
1868.....		10	7	10	21	8	8	10	4	5	....	...
1869.....		10	8	14	28	9	7	9	8	6	2	...
1870.....		15	13	28	39	16	20	7	7	6	1	...
1871.....		13	10	20	28	18	16	9	4	5	2	...
1872.....		17	18	34	54	30	9	12	11	3	1	...
1873.....		27	12	34	31	25	13	13	7	8	2	...
1874.....		10	14	26	32	9	5	10	3	6	2	...
1875.....		23	14	19	43	18	10	10	6	4	....	...
1876.....		21	10	15	24	14	9	6	16	6	3	2
1877.....		22	13	13	36	20	8	5	7	2	2	1
1878.....		17	16	27	47	18	11	12	2	3	2	...
1879.....		19	7	14	26	15	6	3	12	8	3	1
Totals.....		279	176	344	522	248	163	141	112	79	24	5

It will be seen that of the 114 deaths from fever in Rhode Island in 1879, 55, or nearly one-half, occurred in persons between fifteen and forty years of age; and of the 2,100 deaths from fever in a period of fifteen years, 1,114, or considerably more than one-half, occurred during the same twenty-five years of human life. The evidence is conclusive that, unlike pneumonia, its victims are found most largely in the most active and vigorous period of life, and predicated on these facts it may reasonably be presumed that in Rhode Island persons in vigorous life are more prone to fevers, especially of the typhoid form, and that the disease prevails much more largely among them.

## COMPARATIVE RESULTS.

The following Table shows the percentage of total mortality from several prominent causes, as reported in 1879, in the whole State, and in the several divisions of the State; and also the percentages of the same causes in the whole State, in 1877 and 1878:

TABLE LXIV.

CAUSES OF DEATH.	Bristol County.	Kent County.	Newport County, Towns.	Newport City.	Providence County, Towns.	Providence City.	Washington County.	Whole State, 1879.	Whole State, 1878.	Whole State, 1877.
Accidents (all kinds).....	1.42	3.24	5.50	2.52	1.87	2.64	1.81	2.43	2.89	3.10
Apoplexy and Paralysis.....	8.51	3.25	10.53	9.96	5.76	4.42	4.55	5.21	4.45	4.25
Brain, Diseases of.....	2.13	4.69	4.40	4.60	4.05	3.71	.45	3.73	3.23	3.68
Cancer.....	6.38	2.17	3.80	2.51	2.27	3.27	3.18	2.96	2.82	3.17
Cholera Infantum.....	5.67	5.77	6.59	6.27	4.14	2.94	2.73	3.81	3.97	6.08
Consumption.....	11.35	13.72	10.99	14.64	15.98	14.53	21.83	15.09	15.93	15.53
Convulsions and Fits.....	.71	2.17	1.10	4.18	2.03	2.22	.91	2.47	2.65	1.96
Croup.....	2.13	2.17	.....	6.27	2.03	2.13	1.82	2.28	2.20	2.23
Debility.....	4.25	.72	2.20	4.18	3.89	1.44	.91	2.35	1.91	2.65
Diarrhoea.....	.71	1.08	1.10	.84	1.14	1.58	.....	1.26	1.25	2.11
Diphtheria.....	4.96	6.85	2.20	7.54	7.71	5.25	5.45	6.14	10.28	11.56
Dysentery.....	5.67	1.08	4.40	1.25	1.05	.50	1.36	1.04	.95	1.22
Fevers.....	2.84	4.69	4.40	1.26	3.49	1.96	3.18	2.70	3.94	3.55
Heart, Diseases of. . . . .	5.67	7.22	4.40	5.02	3.08	5.50	4.09	4.73	3.92	4.28
Hooping Cough.....	.....	3.97	.....	.42	.97	.74	1.89	1.02	1.38	.75
Hydrocephalus .. . . .	1.42	1.44	1.10	.84	1.05	1.73	.....	1.36	1.65	1.29
Kidneys, Diseases of.....	.71	1.08	1.10	.....	1.86	2.13	3.64	1.88	1.89	1.57
Liver, Diseases of.....	2.84	1.08	1.10	.42	1.05	1.04	2.73	1.17	1.06	1.06
Marasmus.....	1.42	.....	.....	2.51	1.05	1.39	.....	1.16	1.30	.99
Pneumonia and Congestion of the Lungs.....	4.96	5.42	4.40	4.60	8.36	7.72	6.81	7.37	7.49	5.31
Scarlatina.....	2.13	2.17	3.30	.42	3.00	12.64	2.73	7.37	2.03	1.46

In the above Table there are brought together, in a compact form, the percentages of mortality from accidents and several important diseases, by which comparisons in various ways may be readily made.

It should be understood that the proportions are in relation to the whole number of deaths from given causes, in each of the several divisions, and in the whole State.

It has been frequently observed that the larger the community the more uniform, taking one year with another, will be the proportion of deaths from all the usual causes of death. This is true not only in proportion to total mortality from known causes, but also in proportion to population.

In the above Table we can compare the percentages of mortality from any one cause in more than one year, only in the whole State, the percentages in the different named localities being for the year 1879. It will be seen by an examination of the three last columns in the Table, that, with the exception of diseases which may and do occur as epidemics, the percentages of deaths in the whole State, during each of the last three years, from the same cause of death, do not very widely differ, and thereby show a marked contrast to the ratio of mortality from the same cause in the different divisions during the year 1879, as seen in the preceding columns.

It has been before observed that the large death rate from some causes in some localities, has been from the absence, or slight prevalence there, of causes of death prominent in other localities.

For instance, in Newport county towns, the deaths from apoplexy and paralysis were 10.5 per cent. of the whole number of deaths, but there were no decedents from croup, whooping cough or wasting from inanition, and the percentages of deaths from several common diseases, as will be seen in the Table, were exceedingly small, from which the legitimate inference would be, that those diseases were very limited in number, or at most existed only in their mildest form.

It will, therefore, be understood, that although the percentage of mortality from apoplexy and paralysis in Newport county towns, in 1879, was more than twice as large as the percentage of the whole State, it was in a considerable measure the result of a less proportion of deaths from other causes. It must be admitted, however, that apoplexy prevails largely in every year in Newport city and county towns in proportion to the population.

Cholera infantum also shows a large percentage of mortality in Newport county towns in 1879, a proportion about five times as large as that of 1878; and in Newport city a proportion twice as large.

Providence city shows a greatly diminished percentage of deaths from cholera infantum, not less than fifty per cent. compared with the average of ten years.

Consumption has an approximately established proportion in each and every year, in the whole State and in each division.

The differences of percentage of mortality in 1879 from this disease in the different divisions, are, however, quite considerable. The variations are from 11.35 per cent. in Bristol county, to 21.83 per cent. in Washington county.

Croup, which was much less prevalent than usual in all other parts of the State, was largely prevalent and quite fatal in Newport city, causing about one-sixteenth of the total mortality.

The small percentage of deaths from dysentery in the city of Providence, is especially to be noticed. Only one-half of one per cent., a proportion ten times smaller than that of Bristol county, and eight times smaller than that of Newport county towns, is quite remarkable.

Diphtheria, during 1879, gave way to the fearful epidemic of scarlet fever in Providence city, and was less prevalent in all parts of the State than during 1878.

It will be seen that the proportion of deaths from this cause, in 1879, was less than half that of 1877.

Fevers show a lessened mortality in nearly every division of the State, and especially in Newport city.

Pneumonia also shows a smaller death rate than in 1878, prevailing more largely in Providence county towns than elsewhere.

Scarlatina had slight prevalence only in any part of the State except in Providence and the immediate vicinity. In that city, as will be seen by reference to the Table, it was the cause of more than one-eighth of the total mortality.

The mortality from that cause in the whole State, was raised from 1.46 per cent. in 1877, to 7.37 per cent. in 1879.

Comments and comparisons in reference to the items found in Table LXIV. might be continued to an indefinite extent, but with the indications presented, the interested reader can pursue the lines of inquiry to any desired length.

Appended to this Report will be found the Registration Laws of Rhode Island, Chapter 77 of the General Statutes, as amended June, 1875; and April, 1878, by Chapter 680 of the Public Laws; together with said Chapter 680, establishing a State Board of Health, as amended March, 1880; and also Chapter 360 of the General Statutes, in relation to Divorces, as amended by said Chapter 680, and also a synopsis of the Marriage Laws of Rhode Island.

C. H. F.

PROVIDENCE, November, 1880.

## COLLECTION OF RETURNS.

In order to secure as far as possible complete returns of all the births, marriages and deaths, occurring in the different towns, very many plans and methods have been proposed and employed, during the twenty-eight years of registration.

In regard to births, it was for a number of years made the duty of the parents to make returns of each and every birth, as will be seen by the following section of a registration act which passed the General Assembly in 1854:

**SECTION 5. Of Births.** As a large number of births annually take place without the assistance or intervention of strictly professional aid, it shall be the duty of each and every parent to make returns to said city or town clerk of the birth of each of his or her children, in manner and form aforesaid, at least within ten days after the same shall have occurred.

This provision of the law requiring returns to be made by the father or mother, and the duty of the physician or midwife in attendance upon the birth of a child to report the same, having been very generally neglected, it was found necessary to put that work into the hands of some responsible person in each town, who should thoroughly canvass his distinct territory, and by inquiry ascertain all the facts required by law in connection with the births occurring therein.

Upon the revision of the Public Statutes in 1877, section 5 of the chapter in relation to registration of vital statistics was amended so as to read as follows:

**SECTION 5.** It shall be the duty of the clerk of each of the towns annually, in the month of January, to collect the facts required by section 8 of this chapter, in relation to all children born in the town during the year ending on the 31st day of December next preceding, &c.

This section is substantially the same as that which is now the law in relation to the returns of births.

In regard to returns of deaths, the law requires that the "undertaker, or the person who shall conduct a funeral, or who shall bury or deposit in a tomb, or who shall remove from this State or otherwise dispose of the remains of any deceased person or still-born child, shall first obtain the physician's certificate of cause of death, if a physician was in attendance upon such person who has deceased, or the person bringing forth such still-born child, and shall return the same, together with his own certificate of the facts required to be certified by

him, on or before the second Monday of the next succeeding month to the clerk of the town where such death or bringing forth took place."

It also requires that whenever "any person shall die or any still-born child shall be brought forth in this State, it shall be the duty of the physician attending at such bringing forth or last sickness, if any physician so attended, within forty-eight hours after such death or bringing forth, to leave with the family, if any, or person having the care of the deceased or the person bringing forth such still-born child, or to give to the undertaker or person who conducts the funeral, a certificate stating, in case of a death, the name of the deceased, the date of the death and the disease or cause of the death, and in case of the bringing forth of a still-born child, the date and the cause of such child being brought forth still-born."

The provisions of both of the foregoing sections, partially quoted, are practically ignored in many of the country towns, and it therefore becomes necessary in order to obtain as completely as possible the full returns of deaths, that the canvasser of births should also make rigid inquiry in regard to the occurrences of death, and ascertain as far as possible all the facts in relation thereto.

Directions to this effect have been heretofore given, and the canvas of deaths has been for some years nearly, if not quite, as accurate and complete as that of births.

There has been a gradual improvement in all that appertains to the collection and record of vital statistics in the different towns, as evinced by the more full and complete statements of all the facts connected with the events of births, marriages and deaths, which are required by law.

This has been accomplished, however, only by frequently calling the attention of the persons whose duty it is to see that the work is efficiently done, to the requirements of the law, and the means of performance.

Circulars have from time to time been addressed to these parties, urging attention to their duties, and suggesting modes of procedure in collecting, and methods of recording, by which the labor might be facilitated and the results of record made more readily available.

In an early circular from the State Board of Health to the town councils, (as the legal town boards of health,) in relation to various sanitary requirements of the law, the following observations were made in regard to vital statistics:

It is hardly necessary in this connection to call your attention to the great value of correct registration of the births, marriages and deaths in your town. In their civil relations, affording definite evidence as to legal consanguinity, and legal settlement in cases of pauperism, rights of inheritance or entailments, rights and claims for pensions, insurance, or hereditary annuities. In their social relations, as a record and evidence of the public spirit, the moral tone and the disposition for associated interest in the family relation manifested at different periods of time. In their sanitary relations, though usually less apprehended they are no less important. Indeed, without them sanitary investigation would be greatly impeded. Without a record of births and deaths, the bodily vigor, the relative longevity, the average healthfulness, the tendency to particular diseases in any community, could scarcely be determined.

By such record, a clue to the laws of life and health is furnished. Such statistics afford the sanitarian standing ground for observing the effects of localities, conditions, employments and circumstances of life, as causations of disease and sources of mortality. But, for *exact conclusions* there *must be correct returns*. False premises lead to defective and deceptive deductions. An investigation of the methods by which the registration returns of this State have been obtained, and an examination and comparison of the returns so obtained, show that in some towns they are very inaccurate. The number of births returned from a town have been less than the number attended by one practitioner of medicine in the town. Great negligence has also been practised by undertakers and physicians in regard to the returns of deaths. Attention is called to section 12 of chapter 77 of the Statutes, with the hope that every town council will require a record of the names of all the classes therein named, and give due notice to the same that their duties as set forth in section 4, section 6 and section 8 of chapter 77 must be promptly performed.

More recently the following circular was sent to the different town clerks in relation to the collection of returns of births and deaths, and the disposition of the same:

OFFICE OF THE STATE BOARD OF HEALTH, }  
PROVIDENCE, December, 1880. }

*To the Town Clerk of the Town of ——— :*

DEAR SIR,—It is quite desirable that the returns of births, marriages and deaths from the several towns in the State should be as complete and accurate as possible. It is known that some births and deaths occur in the State that fail to be put on record. Among other causes of such failure, the most prominent is the removal of the families in which such births and deaths occur, out of the town in which they occurred, before the collector of returns of births and deaths canvasses the town for them. This defect in regard to births can be greatly remedied by a careful inquiry on the part of every collector of returns in regard to every child of one year old and less, found, *and to be found*, in the town which he is canvassing. When the collector finds a child whose birth occurred in some other town than the one he is canvassing, he should make the same inquiries as in other cases,



and record on same blank returns; the said returns to be put in the hands of the town clerk as in other cases, and recorded by him in the town record, the same as of those whose births occurred in the town, with the exception of stating the town where the birth occurred.

After the town clerk has copied the town record of births on the large registration returns, and forwarded the same to the Secretary of the State Board of Health, he should then send the *collectors* small returns of births that have occurred in other towns to the town clerks of the towns where the births occurred.

The idea is, that the losses and gains in number in the different towns will thereby be best equalized, and the whole number of births in the State more fully ascertained.

The same idea will hold good, not only as between towns, but also as between States. The children born in other States during the year preceding the canvass, and found in this State at the time of the canvass, will be about the same in number as of those born in this State and removed to another State before the canvass is made.

All children then, found in any town whose births occurred during the preceding year, will be enrolled in the town record of births of the town where residing at the time the canvass is made in January, and be forwarded to the State Registrar the same as those born in the town.

The collector should always be instructed to obtain returns of *all* deaths, which may come to his knowledge, whether previously reported to the town clerk or not, and if he obtains information and makes returns of deaths that occurred in other towns, and in families residing in the town which he is canvassing, at the time the returns are collected, the said returns should be recorded and transmitted to the town in which the death occurred, as in the case of births. The fees will be the same as in the ordinary returns.

Physician's certificate of cause of death should always be obtained when possible.

The necessity of exercising great diligence in obtaining correct information in regard to the vital statistics of the towns, should be strongly impressed on the minds of canvassers.

The registration returns of births, marriages and deaths which occurred in the several towns of the State, during the past year, and returnable to this office, should have the returns of each class by itself, and all the leaves of each class should be stitched, or otherwise fastened together in regular order, and the name of the class, whether births, marriages or deaths, and the town from which sent, should be written on the first outside page.

Some of the town returns come in in very good order, and some do not.

Yours respectfully,

CHARLES H. FISHER,

*State Registrar.*

The above circular, and extracts from preceding circulars, will serve to show in some measure the pains that are and have been taken, to secure as far as possible the best attainable results in the collection by

the canvassers of the different towns of the facts in relation to all the circumstances connected with each of the events of births, marriages and deaths.

#### REPORTS FROM LOCAL BOARDS OF HEALTH.

It was observed in a previous report that it was the design of the Secretary to ask of the General Assembly the passage of an ACT by which it should be made the duty of the clerks of the local boards of health to give information when inquiry was made, to the Secretary of the State Board of Health, of such facts and circumstances in relation to disease in their respective localities as might have come to their knowledge.

It will not be forgotten that every town has a local board of health; the Statutes providing that the town council of every town shall by itself constitute a board of health for that town, and the board of aldermen of each city a board of health for that city, unless a special board of health be appointed by those bodies to act in their stead, and under their supervision and direction.

It would be a very unusual circumstance if a disease was prevalent of a severe character, affecting a large number of persons to the extent of disabling them from active exercise, even if not fatal in results; or a largely prevailing disease of a contagious character among domestic animals, dangerous or fatal to life, and the same not be known to the clerk of the local board of health.

It would seem reasonable then that such persons, by virtue of the official position which they hold, should give notice to the Secretary of the Board, to the end that action might be taken by the Board, if deemed necessary, in the direction of investigating the causes of the disease and devising the means of prevention or restriction.

It was with these views that an ACT in addition to the act establishing a State Board of Health was introduced into the General Assembly at the January session of 1880, which was passed, and by which the act establishing the Board was amended so as to read as follows:

SECTION 11. The Secretary of the said Board shall make inquiry from time to time, of the clerks of town and local boards of health, in relation to the prevalence of any disease, or knowledge of any known or generally believed source of disease, or causes of general ill-health, and also in relation to the proceedings of the said boards of health, in respect to acts for the promotion and protection of the public health, and also in relation to diseases among domestic animals in their several towns and localities respectively; and the said clerks of town and local

boards of health shall give such information, in reply to said inquiries, of such facts and circumstances as have come to their knowledge.

In order that the Board may "take cognizance of the interests of life and health among the citizens of the State, and make investigations into the causes of disease, and the sources of mortality, and the effects of localities," it will be necessary to ascertain by inquiry where the diseases needing investigation exist, and where the localities which are the sources of mortality may be found.

It will be seen that the clerks of the local boards of health may be able to make communications to the State Board of very considerable value.

The Secretary has already received replies from those officials to inquiries made in regard to various subjects, and those in answer to a series of questions embodied in a circular sent in January, 1881, which will be found on another page, under the head of "Reports from Towns."

#### REPORTS OF MOST PREVALENT ACUTE DISEASES.

In the report made to the General Assembly, at the May session of 1880, there was presented for the first time tabulated summaries of the monthly returns from the different towns of the acute diseases having the largest prevalence in them during the preceding month.

Of the value of such reports to the student of sanitary science, it is hardly necessary in this connection to make extended remarks. Suffice to say, that they afford an indispensable link in the chain of facts and circumstances which furnishes the necessary material for such study.

But to the Secretary, who desires to keep track of the migratory diseases, and to ascertain what acute diseases appear *regularly* in certain towns at certain seasons, and what acute diseases appear *irregularly* in other towns in the same or in different seasons; with what degree of severity the different diseases appear *regularly* in certain towns, and *irregularly* in others; such reports or returns are absolutely necessary, if the duties of the Board as provided by law, in taking cognizance of the interests of life and health among the citizens of the State, and making investigations into the causes of disease, are complied with.

At first it was designed to ascertain by monthly reports from physicians, not only the diseases prevailing and degree of severity, but also the estimated per centage of mortality, the general amount of sickness of all kinds in comparison with that of corresponding months of

previous years, the mean temperature of the atmosphere, the relative mean humidity of the soil and the atmosphere, the greatest range and character of the fluctuations of humidity and temperature, with the purpose of studying the character and kinds of disease, in connection with the meteorological conditions prevailing during the same periods of time.

The results of the first years attempts to accomplish such a purpose, by the voluntary and uncompensated aid of the physicians of the State, were such as to show the impossibility of the accomplishment of that purpose.

It requires on the part of a correspondent who gives valuable gratuitous service, and continues that service monthly or oftener for long periods of time, an interest and enthusiasm in the subject or labor to which his attention is given, not often found in the average practitioner of medicine, whose time is of value to himself, and to whom whatever leisure he may be able to enjoy free from the demands of his patrons, he desires to employ in recreation or some less distasteful labor.

I am happy, however, to state that there are some practitioners in the State who are always interested in whatever promises to advance the public welfare, and who are willing to give valuable service even at the expense of personal inconvenience and some pecuniary loss.

It was found, notwithstanding the disposition on the part of several correspondents, to fully carry out the purposes of the comprehensive series of questions, proposed in the first circulars and blank returns sent to correspondents for monthly reports, that the returns on the original blanks were, in a considerable proportion of the whole number, too scanty and incomplete to accomplish the desired object. A lack of uniformity in any one line of inquiry was largely fatal to definite conclusions in that direction.

It was found also that to some to whom they were sent the blanks presented such an appearance of complexity and formidableness as to deter from careful examination, and thus be found to be less complex than appearances indicated, and easily filled by any intelligent physician; and to others the idea of regularity and promptness and careful observation was too repugnant to their habits of freedom and irresponsibility, and thus the correspondence failed to be as complete as was to be desired.

It then seemed that a simpler return, which could be filled in a very few moments of time, and reporting only the acute diseases most largely prevailing with the order of prevalence in regard to the largest

number of persons affected, the degree of severity, and proportional amount of general sickness as compared with corresponding months of ordinary years, would receive larger attention.

The following form of return, printed on postal cards, was then adopted:

RETURN OF DISEASES in .....  
and vicinity, during the month of ..... 1880.

	Order of prevalence.	Severity.	General Sickness. Per cent.
Bronchitis .....			
Catarrhal Influenza			
Cerebritis .....			
Cholera Infantum			
Cholera Morbus...			
Croup Membranous			
Croup Spasmodic..			
Diphtheria .....			
Diarrhœa .....			
Dysentery .....			
Fever Typhoid...			
Meningitis Cerebral			
Measles .....			
Pharyngitis .....			
Pneumonia .....			
Pleurisy .....			
Rheumatism .....			
Scarlet Fever.....			
.....			
.....			
.....			
.....			
.....			

*M. D.*

This form of return was used through the year 1880, and the following tabulated summaries of reports of acute diseases most prevalent in the different towns, during that year, were compiled from these postal returns:

*Summary of Reports of the most prevalent acute diseases in the several towns during*

JANUARY, 1880.

TOWNS.	Brain.	Nasal Passages.	Throat.	Bronchial Passages.	Lungs.	Croup.	Diphtheria.	Dysentery and Diarrhea.	Rheumatism.	Scarlet Fever.	Measles and Rubella.	Erysipelas.	Typhoid Fever.	Hooping Cough.	Neurasthenia.	Mumps.
Warren.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Coventry.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
East Greenwich.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
West Greenwich.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Warwick.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Little Compton.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Middletown.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Portsmouth.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tiverton.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Newport City.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Newton.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cumberland.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
East Providence.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Johnston.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
North Providence.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
North Smithfield.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Scituate.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Smithfield.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Woonsocket.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Providence City.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Exeter.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hopkinton.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
North Kingstown.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
South Kingstown.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Richmond.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Westerly.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Figure 1, in the different columns of the Table, indicates the disease affecting the largest number of persons. Fig. 2, the next largest number, and so on. The letters following the figures denote the degree of severity: a, signifying severe, a, average, and m mild. Towns not on the list in the Table failed to make returns.

*Summary of Reports of the most prevalent acute diseases in the several towns during*

FEBRUARY, 1880.

TOWNS.	Brain.	Nasal Passages.	Throat.	Bronchial Passages.	Lungs.	Croup.	Diphtheria.	Dysentery and Diarrhea.	Rheumatism.	Scarlet Fever.	Measles and Rotherm.	Krypidias.	Typhoid Fever.	Hoopmg Cough.	Neurasthenia.	Mumps.
Barrington.		4 a.	1 m.	3 a.	2 a.		6 m.		5 a.							
Warren.		2 a.	1 a.	4 a.	3 a.				5 a.							
Coventry.		2 a.	1 a.	3 a.	3 a.											
East Greenwich.		2 a.	1 a.	2 a.	3 s.											
Warwick.		1 a.	3 m.	2 a.	4 s.											
Little Compton.		3 m.	2 m.	1 a.	4 s.											
Middletown.		2 a.	3 m.	3 a.	1 m.				5 m.							
Portsmouth.		1 m.	3 m.	2 m.	4 a.				4 a.							
Tiverton.		2 a.	3 a.	1 a.	4 a.				4 a.							
Newport City.	6 a.	2 m.	5 m.	3 a.	1 a.	7 s.			5 a.							
Cranston.		2 a.	1 a.	3 a.	4 a.	7 m.										
Cumberland.		3 s.	4 s.	1 s.	2 a.					6 a.						
East Providence.		1 a.	3 s.	4 a.	5 a.					3 s.						
Johnston.		1 a.	2 s.	2 s.	1 a.					4 a.						
Lincoln.		3 a.	2 s.	2 a.	6 s.					4 a.						
North Providence.		1 a.	2 a.	3 a.	6 s.					4 a.						
Pawtucket.		3 a.	3 s.	2 a.	1 a.					4 a.						
Scituate.		2 a.	3 s.	1 a.	4 a.					5 m.						
Smithfield.		2 a.	3 s.	1 a.	4 a.					5 m.						
Woonsocket.		1 m.	2 m.	3 m.	4 a.					5 m.						
Providence City.		5 a.	6 s.	4 a.	2 a.											
Exeter.		3 m.	1 s.	3 a.	4 s.	5 m.										
Hopkinton.		3 m.	1 s.	6 a.	7 a.											
North Kingstown.		1 a.	4 a.	3 a.	3 a.											
Richmond.		2 m.	1 a.	3 a.	6 m.											

Figure 1. In the different columns of the Table, indicates the disease affecting the largest number of persons. Fig. 2, the next largest number, and so on. The letters following the figures denote the degree of severity; s, signifying severe, a, average, and m, mild. Towns not on the list in the Table failed to make returns.

## Summary of Reports of the most prevalent acute diseases in the several towns during

MARCH, 1880.

TOWNS.	Brain.	Nasal Passages.	Throat.	Bronchial Passages.	Lungs.	Croup.	Diphtheria.	Dysentery and Diarrhea.	Rheumatism.	Scarlet Fever.	Measles and Rotheln.	Erysipelas.	Typhoid Fever.	Hooping Cough.	Degree of severity.	Neuralgia.
Barrington.....					1 a.	7 a.			3 a.				5 a.			
Warren.....		4 m.	4 m.	1 a.	4 a.	4 a.		6 m.	3 a.							
Coventry.....		m.	4 m.	1 a.	4 a.	4 a.			3 a.							
East Greenwich.....		4 m.	3 a.	1 a.	4 a.	4 a.			3 a.							
Warwick.....		a.	3 a.	4 a.	4 a.	4 a.			4 a.	6 a.			6 m.			
Little Compton.....		m.	3 a.	4 a.	4 a.	4 a.			3 a.							
Middletown.....		m.	4 m.	4 a.	4 a.	4 a.			4 a.							
Newport City.....	7 a.	m.	4 m.	4 a.	4 a.	6 m.			4 a.							
Cranston.....		a.	5 m.	5 m.	4 a.	3 m.	8 a.	6 a.	3 a.	5 a.						
Cumberland.....		6 m.	5 m.	5 m.	4 a.	3 m.	8 a.	6 a.	3 a.	4 a.						
East Providence.....		1 a.	5 m.	5 m.	4 a.	3 m.	8 a.	6 a.	3 a.	4 a.						
Foster.....	4 s.	3 a.	5 m.	5 m.	4 a.	3 m.	8 a.	6 a.	3 a.	4 a.						
Glocester.....		1 a.	5 m.	5 m.	4 a.	3 m.	8 a.	6 a.	3 a.	4 a.						
Johnston.....		3 a.	5 m.	5 m.	4 a.	3 m.	8 a.	6 a.	3 a.	4 a.						
Lincoln.....		1 a.	5 m.	5 m.	4 a.	3 m.	8 a.	6 a.	3 a.	4 a.						
North Providence.....		1 a.	5 m.	5 m.	4 a.	3 m.	8 a.	6 a.	3 a.	4 a.						
Pawtucket.....		3 a.	5 m.	5 m.	4 a.	3 m.	8 a.	6 a.	3 a.	4 a.						
Scituate.....		1 m.	5 m.	5 m.	4 a.	3 m.	8 a.	6 a.	3 a.	4 a.						
Smithfield.....		1 a.	5 m.	5 m.	4 a.	3 m.	8 a.	6 a.	3 a.	4 a.						
Woonsocket.....		2 a.	5 m.	5 m.	4 a.	3 m.	8 a.	6 a.	3 a.	4 a.						
Providence City.....		7 m.	5 m.	5 m.	4 a.	3 m.	8 a.	6 a.	3 a.	4 a.						
Exeter.....		3 a.	5 m.	5 m.	4 a.	3 m.	8 a.	6 a.	3 a.	4 a.						
Hopkinton.....		3 a.	5 m.	5 m.	4 a.	3 m.	8 a.	6 a.	3 a.	4 a.						
North Kingstown.....		3 a.	5 m.	5 m.	4 a.	3 m.	8 a.	6 a.	3 a.	4 a.						
Richmond.....		1 m.	5 m.	5 m.	4 a.	3 m.	8 a.	6 a.	3 a.	4 a.						
Westerly.....		3 a.	5 m.	5 m.	4 a.	3 m.	8 a.	6 a.	3 a.	4 a.						8 s.

Figure 1, in the different columns of the Table, indicates the disease affecting the largest number of persons. Fig. 2, the next largest number, and so on. The letters following the figures denote the degree of severity; s. signifying severe, a. average, and m. mild. Towns not on the list in the Table failed to make returns.



*Summary of Reports of the most prevalent acute diseases in the several towns during*

APRIL, 1880.

TOWNS.	Brain.	Nasal Passages.	Throat.	Bronchial Passages.	Lungs.	Croup.	Diphtheria.	Dysentery and Diarrhea.	Rheumatism.	Scarlet Fever.	Measles & Rothein.	Krysalpeles.	Typhoid Fever.	Hoopling Cough.	Neurasthenia.	Degree of severity.
Barrington...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Warren...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Coventry...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
East Greenwich.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
West Greenwich.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Warwick.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Little Compton.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Middletown.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Portsmouth.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tiverton.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Newport City.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cranston.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cumberland.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
East Providence.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Foster.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Glocester.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lincoln.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
North Providence.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
North Smithfield.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Pawtucket.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Scituate.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Smithfield.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Woonsocket.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Providence City.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Roxbury.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Woonsocket.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
North Kingstown.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
South Kingstown.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Richmond.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Westerly.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Figure 1. In the different columns of the Table, indicates the disease affecting the largest number of persons. Fig. 2, the next largest number, and so on. The letters following the figures denote the degree of severity; a, average, and m, mild. Towns not on the list in the Table failed to make returns.

*Summary of Reports of the most prevalent acute diseases in the several towns during  
MAY, 1880.*

TOWNS.	Brain.	Nasal Passages.	Throat.	Bronchial Passages.	Lungs.	Croup.	Diphtheria.	Dysentery & Diarrhoea.	Rheumatism.	Scarlet Fever.	Measles and Rotheln.	Erysipelas.	Typhoid Fever.	Hooping Cough.	Degree of severity.	Neurasthenia.	Degree of severity.	Intermittent Fever.	Degree of severity.
Barrington.....	.....	.....	1 m.	2 a.	.....	4 a.	.....	6 a.	3 m.	5 a.	.....	.....	4 a.	7 a.	.....	.....	.....	.....	.....
Warren.....	.....	2 a.	3 m.	1 a.	2 m.	.....	.....	.....	3 m.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
East Greenwich.....	.....	1 a.	4 a.	5 m.	2 m.	5 m.	.....	.....	3 a.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Warwick.....	.....	1 a.	.....	4 m.	4 m.	.....	.....	.....	3 a.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Little Compton.....	.....	5 m.	3 m.	4 m.	.....	.....	.....	.....	1 a.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Portsmouth.....	.....	2 m.	3 m.	1 m.	.....	.....	.....	.....	4 a.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tiverton.....	5 a.	3 m.	2 m.	1 m.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Newport City.....	.....	.....	.....	2 a.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cranston.....	1 a.	.....	7 a.	2 a.	2 a.	.....	.....	.....	4 m.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cumberland.....	.....	.....	.....	2 a.	2 a.	.....	.....	.....	4 m.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
East Providence.....	.....	1 m.	.....	1 m.	5 m.	.....	.....	.....	3 m.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Foster.....	.....	.....	4 a.	2 a.	1 a.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Glocester.....	.....	.....	.....	2 a.	1 a.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Johnston.....	.....	4 m.	5 m.	2 m.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lincoln.....	.....	.....	.....	2 m.	1 m.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
North Providence.....	.....	.....	.....	5 a.	1 m.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
North Smithfield.....	.....	2 m.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pawtucket.....	.....	4 m.	.....	1 a.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Saltwater.....	.....	.....	2 a.	1 a.	5 m.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Smithfield.....	.....	.....	1 m.	4 m.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Woonsocket.....	.....	3 a.	1 m.	7 a.	2 a.	6 m.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Providence City.....	9 a.	6 m.	.....	6 a.	2 a.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Charlestown.....	.....	.....	.....	2 a.	2 a.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Exeter.....	.....	.....	.....	2 a.	2 a.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hopkinton.....	.....	1 a.	2 a.	3 m.	4 a.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
North Kingstown.....	.....	3 a.	1 a.	2 a.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
South Kingstown.....	.....	.....	.....	2 a.	3 m.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Richmond.....	.....	6 m.	.....	2 a.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Westerly.....	.....	3 a.	4 a.	.....	7 a.	3 a.	5 a.	4 a.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Figure 1, in the different columns of the Table, indicates the disease affecting the largest number of persons. Fig. 2, the next largest number, and so on. The letters following the figures denote the degree of severity; s, signifying severe, a, average, and m, mild. Towns not on the list in the Table failed to make returns.

*Summary of Reports of the most prevalent acute diseases in the several towns during*

JUNE, 1880.

TOWNS.	Brain.	Nasal Passages.	Throat.	Bronchial Passages.	Lungs.	Croup.	Diphtheria.	Dysentery & Diarrhea.	Rheumatism.	Scarlet Fever.	Measles and Rotheln.	Cholera Infantum.	Typhoid Fever.	Hoopings Cough.	Cholera Morbus.	Degree of severity.	Malarial Fever.	Degree of severity.
Barrington...	8 s.	4 m.	5 m.	4 m.	1 m.	9 m.	...	7 m.	2 m.	1 a.	...	6 m.	...	...	...	...	...	...
Bristol...	...	4 m.	4 m.	3 m.	6 m.	...	...	6 m.	2 m.	...	...	5 m.	...	...	...	...	...	...
Warren...	...	3 m.	7 m.	1 m.	5 m.	...	...	3 m.	4 m.	...	...	...	...	...	...	...	...	...
East Greenwich...	...	1 a.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Warwick...	...	1 m.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Little Compton...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Portsmouth...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tiverton...	6 a.	...	...	...	4 s.	5 a.	...	1 s.	...	4 m.	...	3 s.	...	...	...	...	...	...
Newport City...	...	...	...	...	3 s.	...	...	1 a.	5 a.	...	...	2 a.	...	...	...	...	...	...
Cranston...	...	1 a.	3 a.	2 a.	...	...	...	6 m.	4 a.	...	...	9 m.	...	...	...	...	...	...
Cumberland...	...	...	7 m.	8 m.	2 a.	...	...	1 a.	3 a.	4 a.	...	...	...	...	...	...	...	...
East Providence...	...	2 m.	1 m.	...	...	...	...	3 m.	...	6 m.	...	...	...	...	...	...	...	...
Foster...	1 m.	1 m.	...	2 m.	5 m.	...	...	3 m.	...	...	...	...	...	...	...	...	...	...
Gloucester...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Johnston...	...	...	1 m.	2 m.	...	...	...	2 m.	...	3 a.	...	4 m.	...	...	...	...	...	...
Lincoln...	...	3 m.	1 m.	2 m.	2 m.	...	...	4 m.	...	...	...	5 m.	...	...	...	...	...	...
North Providence...	...	...	1 m.	1 m.	2 m.	...	...	3 m.	...	3 a.	...	8 m.	...	...	...	...	...	...
North Smithfield...	...	...	...	1 a.	1 a.	...	...	2 m.	...	4 a.	...	...	...	...	...	...	...	...
Pawtucket...	...	2 m.	7 m.	3 m.	...	...	...	2 m.	...	3 a.	...	...	...	...	...	...	...	...
Scituate...	...	5 m.	4 m.	4 m.	...	...	...	1 a.	...	4 a.	...	...	...	...	...	...	...	...
Smithfield...	...	...	1 a.	1 a.	1 a.	...	...	3 m.	...	...	...	...	...	...	...	...	...	...
Woonsocket...	...	4 m.	...	1 a.	5 s.	...	...	2 m.	...	2 a.	...	5 m.	...	...	...	...	...	...
Providence City...	6 a.	...	4 m.	5 a.	...	...	...	3 m.	...	1 a.	...	7 a.	...	...	...	...	...	...
Charlestown...	...	1 a.	4 a.	5 a.	...	...	...	2 a.	...	2 a.	...	...	...	...	...	...	...	...
Exeter...	...	1 a.	3 a.	2 a.	...	...	...	3 m.	...	...	...	...	...	...	...	...	...	...
Hopkinton...	...	6 m.	1 s.	7 m.	...	...	...	4 m.	...	5 a.	...	...	...	...	...	...	...	...
North Kingstown...	...	1 a.	3 a.	...	5 m.	...	...	2 m.	...	...	...	...	...	...	...	...	...	...
Richmond...	...	1 a.	4 a.	3 a.	...	...	...	2 m.	...	...	...	...	...	...	...	...	...	...
Westerly...	...	3 m.	5 m.	4 m.	...	...	...	2 m.	...	...	...	...	...	...	...	...	...	...

Figure 1. in the different columns of the Table, indicates the disease affecting the largest number of persons. Fig. 2. the next largest number, and so on. The letters following the figures denote the degree of severity: s. signifying severe, a. average, and m. mild. Towns not on the list in the Table failed to make returns.

## Summary of Reports of the most prevalent acute diseases in the several towns during

JULY, 1880.

TOWNS.	Brain.	Nasal Passages.	Throat.	Bronchial Passages.	Lungs.	Croup.	Diphtheria.	Dysentery and Diarrhea.	Rheumatism.	Scarlet Fever.	Measles and Whooping Cough.	Cholera Infantum.	Typhoid Fever.	Whooping Cough.	Cholera Morbus.	Degree of severity.	Malarial Fever.
Barrington.		4 m.	3 a.	2 a.	7 a.			1 a.	6 m.			1 a.	6 m.				
Warren.		4 m.		5 m.				3 a.									
East Greenwich.		4 m.						3 a.									
Warwick.		4 m.	6 m.	6 m.			2 m.	1 a.	6 m.	5 a.		4 a.	2 m.				
Portsmouth.			6 m.					3 m.				3 a.					
Tiverton.								4 m.									
Newport City.	5 m.																
Burrillville.																	
Cranston.	6 a.	3 m.	6 m.	7 a.	4 a.		2 m.	1 a.		3 a.		4 a.					
Cumberland.								3 a.		3 a.		2 s.					
East Providence.							4 m.	1 a.	5 a.	8 a.		2 s.					
Foster.								1 a.				2 s.					
Glocester.	4 m.		5 m.	6 m.				1 m.				3 a.	1 a.				
Johnston.			6 m.	6 m.				2 m.				3 a.					
Lincoln.		5 m.	6 m.	3 a.				4 m.				2 s.					
North Smithfield.	7 a.							1 m.		8 a.		2 a.					
Pawtucket.	5 a.		6 m.					2 a.				2 a.	5 m.				
North Smithfield.	4 a.				7 a.		3 a.	2 a.				2 a.	4 m.				
Situate.			5 m.					1 m.				2 a.	4 m.				
Smithfield.	5 s.							2 a.				2 a.	4 m.				
Woonsocket.					6 a.		5 m.	2 a.				1 a.	7 m.	8 m.			
Providence City.	4 a.						6 m.	2 a.	5 a.	4 m.		4 a.	3 m.				
Charlestown.		7 s.	2 a.					2 a.				6 a.	3 a.				
Exeter.		5 a.						2 a.				4 a.	3 a.				
Hopkinton.	7 s.	8 a.	3 m.					2 a.				4 a.	3 a.				
North Kingstown.		5 a.	4 m.					2 a.				4 a.	3 a.				
Richmond.		5 a.						1 a.				4 a.	3 a.				
Westerly.		5 a.	7 a.		5 a.		4 a.	1 a.				4 a.	3 a.				6 s.

Figure 1, in the different columns of the Table, indicates the disease affecting the largest number of persons. Fig. 2, the next largest number, and so on. The letters following the figures denote the degree of severity; s, signifying severe, a, average, and m, mild. Towns not on the list in the Table failed to make returns.

*Summary of Reports of the most prevalent acute diseases in the several towns during*

August, 1880.

TOWNS.	Brain.	Nasal Passages.	Throat.	Bronchial Passages.	Lungs.	Croup.	Diphtheria.	Dysentery and Diarrhea.	Rheumatism.	Scarlet Fever.	Measles and Whooping Cough.	Cholera Infantum.	Typhoid Fever.	Whooping Cough.	Cholera Morbus.	Degree of severity.	Malarial Fever.	Degree of severity.
Barrington	6 m.	6 m.	4 m.	4 m.	6 m.	6 m.	3 a.	5 m.	5 m.	3 a.	3 a.	3 a.	7 m.	7 m.	3 a.	3 a.	1 a.	1 a.
Warren	5 m.	5 m.	4 m.	4 m.	6 m.	6 m.	1 a.	7 a.	7 a.	1 a.	1 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.
East Greenwich	4 s.	4 s.	4 s.	4 s.	6 a.	6 a.	1 m.	5 a.	5 a.	3 m.	3 m.	3 m.	3 m.	3 m.	1 m.	1 m.	1 m.	1 m.
Little Compton	2 s.	2 s.	2 s.	2 s.	6 m.	6 m.	3 m.	7 m.	7 m.	3 m.	3 m.	3 m.	3 m.	3 m.	3 m.	3 m.	3 m.	3 m.
Norton	7 a.	7 a.	7 m.	7 m.	6 m.	6 m.	1 m.	5 a.	5 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.
Newport City	8 a.	8 a.	8 a.	8 a.	6 m.	6 m.	1 m.	5 a.	5 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.
Cranston	9 a.	9 a.	9 a.	9 a.	5 m.	5 m.	1 m.	5 a.	5 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.
Scituate	8 a.	8 a.	8 a.	8 a.	5 m.	5 m.	1 m.	5 a.	5 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.
East Providence	4 m.	4 m.	4 m.	4 m.	5 m.	5 m.	1 m.	5 a.	5 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.
Providence	7 a.	7 a.	7 m.	7 m.	6 m.	6 m.	1 m.	5 a.	5 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.
Lincoln	8 a.	8 a.	8 a.	8 a.	6 m.	6 m.	1 m.	5 a.	5 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.
North Providence	4 a.	4 a.	4 a.	4 a.	5 m.	5 m.	1 m.	5 a.	5 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.
Pawtucket	8 a.	8 a.	8 a.	8 a.	6 m.	6 m.	1 m.	5 a.	5 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.
Attleboro	7 a.	7 a.	7 m.	7 m.	6 m.	6 m.	1 m.	5 a.	5 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.
Smithfield	7 a.	7 a.	7 m.	7 m.	6 m.	6 m.	1 m.	5 a.	5 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.
Providence City	5 a.	5 a.	5 a.	5 a.	6 m.	6 m.	1 m.	5 a.	5 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.
Charlestown	5 m.	5 m.	5 a.	5 a.	6 m.	6 m.	1 m.	5 a.	5 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.
Hopkinton	4 m.	4 m.	4 a.	4 a.	6 m.	6 m.	1 m.	5 a.	5 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.
North Kingstown	4 a.	4 a.	4 a.	4 a.	6 m.	6 m.	1 m.	5 a.	5 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.
South Kingstown	4 a.	4 a.	4 a.	4 a.	6 m.	6 m.	1 m.	5 a.	5 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.
Richmond	5 a.	5 a.	5 a.	5 a.	6 m.	6 m.	1 m.	5 a.	5 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.
Westerly	8 a.	8 a.	8 a.	8 a.	7 a.	7 a.	3 s.	5 a.	5 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.

Figure 1, in the different columns of the Table, indicates the diseases affecting the largest number of persons. Fig. 2, the next largest number, and so on. The letters following the figures denote the degree of severity; s, signifying severe, a, average, and m, mild. Towns not on the list in the Table failed to make returns.

*Summary of Reports of the most prevalent acute diseases in the several towns during*

SEPTEMBER, 1880.

TOWNS.	Brain.	Nasal Passages.	Throat.	Bronchial Passages.	Lungs.	Croup.	Diphtheria.	Dysentery and Diarrhea.	Rheumatism.	Scarlet Fever.	Measles and Kopeln.	Cholera Infantum.	Typhoid Fever.	Hoopmg Cough.	Cholera Morbus.	Degree of severity.	Degree of severity.	Degree of severity.	Degree of severity.	Degree of severity.	Degree of severity.
Barrington.		6 a.		5 a.	8 a.			2 m.				3 m.	4 a.			1 s.					
Warren.		5 a.		4 a.	2 a.								1 a.			4 m.					
Little Greenwich.		1 s.		2 a.	4 m.		5 a.	3 m.	3 a.												
Little Compton.					2 m.			3 m.	5 s.				1 m.			4 m.					
Weymouth.																					
Newport City.	9 a.	3 m.	6 a.			8 m.	5 m.	2 a.		7 a.		3 a.	1 a.	1 a.	1 a.						
Cranston.			6 m.	2 a.				1 m.					1 m.			1 a.					
Cambridge.			2 m.					1 m.		5 a.		1 m.	1 m.			1 a.					
East Providence.			2 m.			4 m.	5 m.	1 a.		6 a.		5 m.	3 a.			1 m.					
Woonsocket.	8 a.		2 m.					1 m.				6 m.	6 m.			1 m.					
North Providence.	2-3 a.	3 a.	2 m.	3 a.	2 a.			1 m.				5 m.	3 a.			1 m.					
Providence.	2-3 a.	3 m.	3 m.	3 a.	3 a.	6 a.	5 a.	4 a.				2 a.	4 m.			1 m.					
Smithfield.			6 a.			8 m.	5 a.	1 a.				2 a.	2 a.			1 a.					
Providence City.	6 a.	3 s.				8 m.	5 a.	2 a.		4 a.		1 a.	3 a.	1 m.	1 m.	1 a.					
Charlestown.								3 a.		1 a.			1 a.			6 m.					
Easton.		3 a.		5 a.				3 a.		2 m.		6 a.	1 a.			1 a.					
Hopkinton.		3 a.		3 a.				3 a.		2 m.			1 a.			1 a.					
North Kingstown.		6 a.			2 a.		5 a.	5 m.	3 a.				7 m.			8 a.					
Richmond.		4 s.				9 a.	3 a.	2 s.	6 m.	2 a.		1 s.	3 m.			5 a.					
Westerly.				8 a.	6 m.		4 a.	2 s.								10 m.					

Figure 1, in the different columns of the Table, indicates the disease affecting the largest number of persons. Fig. 2, the next largest number, and so on. The letters following the figures denote the degree of severity: s, signifying severe, a, average, and m, mild. Towns not on the list in the Table failed to make returns.

*Summary of Reports of the most prevalent acute diseases in the several towns during*

OCTOBER, 1880.

TOWNS.	Brain.	Nasal Passages.	Throat.	Bronchial Passages.	Lungs.	Croup.	Diphtheria.	Dysentery and Diarrhea.	Rheumatism.	Scarlet Fever.	Measles and Rotheln.	Cholera Infantum.	Typhoid Fever.	Hoopling Cough.	Cholera Morbus.	Malarial Fever.
	Degree of severity.	Degree of severity.	Degree of severity.	Degree of severity.	Degree of severity.	Degree of severity.	Degree of severity.	Degree of severity.	Degree of severity.	Degree of severity.	Degree of severity.	Degree of severity.	Degree of severity.	Degree of severity.	Degree of severity.	Degree of severity.
Barrington																
Warren		7 a.	4 a.	8 a.	2 a.	6 a.	8 m.	4 m.	4 m.	6 a.	6 a.		5 a.	5 a.	10 a.	1 a.
East Greenwich		7 a.	2 a.	1 a.	3 m.	3 a.	9 a.	2 m.	4 m.	5 a.			6 a.	1 a.	4 m.	
Little Compton		1 s.		5 a.	3 m.	3 s.							4 m.			
Portsmouth		5 s.		3 a.	2 m.	5 a.							1 m.			
Tiverton		5 s.	4 a.	3 a.	4 m.	4 m.	6 m.		2 m.	3 m.			1 m.			
Cranston		5 s.		2 m.	2 a.	5 m.	6 m.	5 m.	9 m.	7 a.			1 m.			
Cumberland	8 a.	1 m.	6 m.	2 m.	1 a.	4 m.	6 m.		7 m.	8 a.			5 a.		3 m.	
East Providence	9 a.	2 m.	3 a.	4 m.	1 a.	4 m.	6 m.		4 m.	6 m.		3 m.	5 a.		4 m.	
Foster		1 m.					2 m.						5 a.			
Glocester		3 m.	1 m.				5 m.	6 m.	4 m.	7 a.			6 a.			
Johnston	8 a.	3 m.	3 a.	4 a.	1 a.	3 a.	5 m.						6 m.			
Lincoln		2 m.	3 a.	1 m.	2 a.	3 a.	5 m.		5 m.	7 a.			6 m.			
North Providence		1 m.	3 m.	4 m.	2 a.	5 a.	7 m.				1 m.		4 m.			
North Smithfield		2 a.	4 a.	3 a.	6 s.	5 a.	7 m.		5 m.	8 a.	10 m.		4 m.			
Pawtucket	9 a.	2 m.	4 a.	3 a.	1 a.	5 a.	7 m.		6 m.	8 a.			1 a.	5 a.		
Scituate		2 m.	4 a.	3 a.	2 a.	4 a.	5 m.		6 m.	6 a.			4 a.			
Smithfield		2 a.	1 a.	3 a.	7 a.	7 a.	4 m.	4 m.	6 a.	6 a.	1 a.		5 m.			
Woonsocket	8 s.	2 a.		6 m.	2 a.		4 m.		4 m.	3 a.		6 m.	1 a.	7 m.		
Providence City	5 a.	6 a.	5 m.				1 s.	1 s.	7 a.	3 a.			2 s.		3 a.	6 m.
Charlestown		6 m.	4 a.	5 a.	3 m.		5 s.	2 a.	7 a.				3 a.		4 a.	
Hopkinton		6 m.	1 a.	5 a.	3 m.		2 m.	2 m.					1 m.			
North Kingstown		4 a.	4 a.	5 a.	3 m.		1 a.	5 a.	7 a.	3 m.		6 a.	1 m.			8 m.
Richmond		4 a.		7 a.	5 a.	9 a.	3 m.	5 a.					2 a.			10 m.
Westerly		8 a.														

Figure 1, in the different columns of the Table, indicates the disease affecting the largest number of persons. Fig. 2, the next largest number, and so on. The letters following the figures denote the degree of severity; s, signifying severe; a, average, and m, mild. Towns not on the list in the Table failed to make returns.

*Summary of Reports of the most prevalent acute diseases in the several towns during  
NOVEMBER, 1880.*

TOWNS.	Brain.	Nasal Passages.	Throat.	Bronchial Passages.	Lungs.	Croup.	Diphtheria.	Dysentery and Diarrhea.	Rheumatism.	Degree of severity.	Scarlet Fever.	Measles and Hoehn.	Kyphilias.	Typhoid Fever.	Hoopling Cough.	Degree of severity.	Neuralgia.
Barrington.		3 a.	2 m.	1 m.	5 m.	4 m.			3 a.	3 a.				6 a.			
Warren.		2 a.	6 m.	1 a.	7 a.	4 a.								1 a.	1 a.	8 a.	
East Greenwich.		3 a.	4 s.	2 s.	1 s.	5 s.								4 m.			
Little Compton.		1 m.		3 m.	3 a.									4 m.			
Portsmouth.					2 a.									4 m.			
Tiverton.																	
Newport City.		1 m.	4 m.	3 a.	2 a.												
Cranston.		1 m.	1 m.	4 m.	3 a.	4 m.											
Cumberland.		2 a.		1 m.	3 a.												
East Providence.		2 a.	1 m.	1 m.	3 a.												
Foster.	3 s.	2 m.		1 m.	1 m.												
Gloucester.																	
Johnston.		1 m.	4 m.	1 m.	3 a.	4 m.											
Lincoln.		1 m.	4 m.	3 a.	3 a.												
North Providence.		2 a.	4 a.	3 a.	3 a.												
North Smithfield.		2 a.	6 a.	2 a.	3 m.												
Pawtucket.		1 m.	2 m.	1 a.	5 m.												
Scituate.		3 a.	4 m.	4 a.	7 m.	3 s.											
Smithfield.		1 m.	6 m.	2 a.	3 a.												
Woonsocket.		3 a.	7 m.	4 a.	6 a.	8 a.											
Providence City.	8 a.	2 a.	9 m.	4 a.	1 a.	8 a.											
Charlestown.		2 a.	1 s.	6 m.	5 m.												
Hopkinton.		2 a.	1 s.	6 m.	8 a.	7 s.											
North Kingstown.		2 a.			3 a.												
Richmond.		3 a.		7 m.	5 a.												
Westerly.	6 m.	3 m.		5 m.	8 m.	4 m.	1 a.										

Figure 1, in the different columns of the Table, indicates the disease affecting the largest number of persons. Fig. 2, the next largest number, and so on. The letters following the figures denote the degree of severity; s, signifying severe, a, average, and m, mild. Towns not on the list in the Table failed to make returns.



*Summary of Reports of the most prevalent acute diseases in the several towns during*

DECEMBER, 1880.

TOWNS.	Brain.	Nasal Passages.	Degree of severity.	Throat.	Degree of severity.	Bronchial Passages.	Degree of severity.	Lungs.	Degree of severity.	Croup.	Degree of severity.	Diphtheria.	Degree of severity.	Dysentery and Diarrhea.	Degree of severity.	Rheumatism.	Degree of severity.	Scarlet Fever.	Degree of severity.	Measles and Rotheln.	Degree of severity.	Erysipelas.	Degree of severity.	Typhoid Fever.	Degree of severity.	Whooping Cough.	Degree of severity.	Neurasthenia.	Degree of severity.	
Barrington.		1 m.	3 m.	3 m.	6 m.	6 a.	5 m.	6 a.	5 m.	6 a.	5 m.	6 a.	5 m.	6 a.	5 m.	6 a.	5 m.	6 a.	5 m.	6 a.	5 m.	6 a.	5 m.	6 a.	5 m.	6 a.	5 m.	6 a.	5 m.	6 a.
Warren.		2 a.	3 a.	3 a.	6 a.	6 a.	5 a.	6 a.	5 a.	6 a.	5 a.	6 a.	5 a.	6 a.	5 a.	6 a.	5 a.	6 a.	5 a.	6 a.	5 a.	6 a.	5 a.	6 a.	5 a.	6 a.	5 a.	6 a.	5 a.	6 a.
East Greenwich.		1 a.	3 m.	4 m.	4 a.	4 m.	4 a.	4 a.	4 a.	4 a.	4 a.	4 m.	4 a.	4 m.	4 a.	4 m.	4 a.	4 m.	4 a.	4 m.	4 a.	4 m.	4 a.	4 m.	4 a.	4 m.	4 a.	4 m.	4 a.	4 m.
Warwick.		3 a.	3 a.	4 m.	4 a.	4 m.	4 a.	4 a.	4 a.	4 a.	4 a.	4 m.	4 a.	4 m.	4 a.	4 m.	4 a.	4 m.	4 a.	4 m.	4 a.	4 m.	4 a.	4 m.	4 a.	4 m.	4 a.	4 m.	4 a.	4 m.
Little Compton.		1 s.	3 m.	4 m.	4 a.	4 m.	4 a.	4 a.	4 a.	4 a.	4 a.	4 m.	4 a.	4 m.	4 a.	4 m.	4 a.	4 m.	4 a.	4 m.	4 a.	4 m.	4 a.	4 m.	4 a.	4 m.	4 a.	4 m.	4 a.	4 m.
Middletown.																														
Portsmouth.		1 m.	2 m.	3 m.	4 a.	4 a.	3 m.	3 m.	4 a.	4 a.	3 m.	4 a.	3 m.	4 a.	3 m.	4 a.	3 m.	4 a.	3 m.	4 a.	3 m.	4 a.	3 m.	4 a.	3 m.	4 a.	3 m.	4 a.	3 m.	4 a.
Tiverton.		3 a.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.
Cranston.		3 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.
Cumberland.		2 a.	3 a.	3 a.	4 a.	4 a.	4 a.	4 a.	4 a.	4 a.	4 a.	4 m.	4 a.	4 m.	4 a.	4 m.	4 a.	4 m.	4 a.	4 m.	4 a.	4 m.	4 a.	4 m.	4 a.	4 m.	4 a.	4 m.	4 a.	4 m.
East Providence.		2 a.	3 a.	3 a.	4 a.	4 a.	4 a.	4 a.	4 a.	4 a.	4 a.	4 m.	4 a.	4 m.	4 a.	4 m.	4 a.	4 m.	4 a.	4 m.	4 a.	4 m.	4 a.	4 m.	4 a.	4 m.	4 a.	4 m.	4 a.	4 m.
Foster.		1 m.	3 a.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.
Johnston.		2 a.	3 a.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.
Lincoln.		2 a.	3 a.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.
North Providence.		2 a.	3 a.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.
North Smithfield.		2 a.	3 a.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.
Pawtucket.		2 m.	4 a.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.
Scituate.																														
Woonsocket.		3 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.
Providence City.	9 a.	3 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.
Charlestown.		1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.
Exeter.		2 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.
Hopkinton.		3 a.	1 s.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.	4 m.
North Kingstown.		1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.	1 a.
Richmond.		1 s.	1 s.	1 s.	1 s.	1 s.	1 s.	1 s.	1 s.	1 s.	1 s.	1 s.	1 s.	1 s.	1 s.	1 s.	1 s.	1 s.	1 s.	1 s.	1 s.	1 s.	1 s.	1 s.	1 s.	1 s.	1 s.	1 s.	1 s.	1 s.
Westerly.	8 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.	3 a.

Figure 1, in the different columns of the Table, indicates the disease affecting the largest number of persons. Fig. 2, the next largest number, and so on. The letters following the figures denote the degree of severity; a, signifying severe, a, average, and m, mild. Towns not on the list in the Table failed to make returns.

## RETURNS OF PREVALENT DISEASES.

In the tabulated summaries of monthly reports of the acute diseases most prevalent in the several towns, in each of the different months of the year, presented on the preceding pages, there is much to interest the sanitarian in noting the changing or apparent transmission of certain contagious diseases from one town to another; the persistence of the same and others in clinging to some one locality during the entire year; the various degrees of severity in which the different diseases appear in the different towns; the different relative proportions of prevalence in comparison of one disease with another; and many other aspects and phases of condition and circumstances appertaining to the appearance and continuance of the various diseases in the various sections of the State.

As stated in a previous report, if the returns of the prevalence of diseases in *all* the towns throughout the State, with the attendant circumstances, fully reported monthly, as desired by the Secretary, could be accomplished promptly and continuously, it would afford great facilities for studying the spread of the contagious and infectious diseases, in regard to the mode of transportation or travel; that is, whether they are communicated from one town to another in a direct line of travel as a rule, where communication is frequent and uninterrupted; or whether their mode of travel is by leaping over portions of territory as it were, and reappearing in towns or places at a distance, and not contiguous with those where they had prevailed at a time immediately preceding.

If it should be found that any one of the contagious or infectious diseases which is in any important degree fatal to life, moved in any regular and straightforward path, it would be a fact of great value, as affording to those who were seemingly in its line of travel, an opportunity at least to prepare for its approach and presence, if it did not indeed afford the possibility of arresting its progress altogether. It is only by collecting a great number of observations, and a comparison of them when so collected, that the nature and characteristics of all diseases, whether transmissible or not, can be ascertained. And it is also by a great number of observations made in any town or section, and reported from time to time, that it can be determined, with any degree of accuracy, what diseases that town or section is especially liable to, and what means may be taken for their prevention or restriction.

It will be observed that in the tabulated summaries of monthly

returns, on the preceding pages, the columns of meteorological conditions, relative to temperature, humidity and fluctuations of the weather, as presented in the Second Annual Report of the Secretary, are omitted.

It was found by the results of observations during the year 1879, taken in various sections of the State, that the meteorological conditions of the different sections were quite uniform, the principal differences being in regard to humidity from summer showers.

It was therefore decided to make the mean average results of the observations taken in the vicinity of Providence city and in the city of Newport the mean average for the State. These have been collected, and with a monthly account of the fluctuations in relation to frequency and range of temperature, kept by the Secretary, the general results in each of the months, will be found in the following pages.

## METEOROLOGY.

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It was remarked in the Second Annual Report of the Board, in allusion to the monthly reports of meteorological observations made in the several towns in the State, that there were few differences of any magnitude in regard to mean humidity, or range, and frequency of change; and that in regard to mean temperature the monthly reports were also very uniform, and so continued through the year.

It was also remarked that the uniformity having continued so steadily through the twelve months of the year, it seemed to settle the question, presumably at least, that such observations made at two or three points, which would cover the possible differences between the meteorological conditions of the inland towns and those upon the bay and seashore, would answer for all practical purposes for all the towns in the State.

In order to present a general summary of the meteorological conditions prevailing throughout the State, in each of the several months of the year 1880, recourse has been had to the Signal Station at Newport, under charge of Col. Wm. McGillivray, Sergeant Signal Corps U. S. Army, and the office of the City Engineer of Providence.

The tables, kindly furnished from each of these sources, will be found on the following pages. The observations reported at the City Engineer's office in Providence were made at the City Hall, and at the pumping stations of the city water works in Providence and Cranston:

## METEOROLOGICAL TABLE.

*From City Engineer's Office, Providence.*

1880.	Maximum Temperature.	Minimum Temperature.	Mean Temperature.	Average Daily Range of Temperature.	Monthly Range of Temperature between Maximum and Minimum.	Total Rainfall.	Prevailing Direction of Wind.
January .....	60.	—1	34.5	20.2	61.	3.26	N. W.
February.....	63.	—2	32.4	20.7	64.	6.30	N. W.
March.....	69.5	15.5	35.2	14.7	54.	5.20	N. W.
April.....	68.	24.	48.5	17.2	44.	3.92	S. W.
May.....	93.	39.	65.6	17.3	54.	1.00	S. W.
June ... ..	93.	45.	70.1	18.2	48.	1.26	N. W.
July.....	90.	54.	74.2	14.7	36.	7.31	S. W.
August.....	86.	48.	70.6	16.4	38.	6.25	S. W.
September.....	88	42.	64.	14.3	46.	2.52	S. W.
October.. ..	74.	28.	50.3	18.2	46.	3.69	N. W.
November.. ..	66.	12.5	38.6	16.7	43.5	3.78	N. W.
December.....	45.	—1	25.5	13.7	46.	3.79	N. W.
Whole year.....			50.8	Total of rain and melted snow during the year.....		48.28	inches.

## METEOROLOGICAL TABLE.

*From Station of Signal Service Corps U. S. A., Newport.*

1880.	Maximum Temperature.	Minimum Temperature.	Mean Temperature.	Average Daily Range of Temperature.	Extreme Range of Temperature.		Total Rainfall.	Prevailing Direction of Wind.	Monthly Range of Temperature (i. e. difference between highest maximum and lowest minimum Temperature).
					Greatest Daily Range.	Least Daily Range.			
January .....	61.5	15.0	38.3	16.1	33.5	8.5	2.14	S. W.	46.5
February .....	56.0	2.5	35.8	17.4	35.5	9.0	3.65	W.	53.5
March.....	59.5	14.0	36.7	14.6	27.0	5.0	5.93	N. W.	45.5
April.....	63.0	26.0	45.5	14.2	22.5	5.0	4.69	S. W.	37.0
May .....	84.5	37.0	58.4	14.3	30.5	4.0	1.12	S. W.	47.5
June .....	86.0	49.0	66.9	15.7	25.0	8.0	1.95	S. W.	37.0
July.....	88.0	58.0	71.5	13.3	22.0	7.0	5.86	S. W.	30.0
August.....	84.0	53.0	69.2	13.4	22.0	6.0	7.15	S. W.	31.0
September....	87.0	48.0	64.3	12.4	20.5	6.0	2.80	S. W.	39.0
October.....	70.0	33.5	53.5	14.7	22.5	9.5	3.59	S. W.	36.5
November....	64.0	15.0	41.1	13.7	22.5	7.0	4.01	W.	49.0
December.....	50.0	1.5	29.7	14.0	22.0	8.5	4.87	W.	48.5
Mean annual	temperature	50.9	Total amount of rain and melted snow during the year.....				47.76	inches.	

WM. MCGILLIVRAY,

*Sergeant Signal Corps U. S. A.*

It will be observed how nearly equal, as shown by the preceding Tables, were the mean annual temperatures of the cities of Providence and Newport. It will also be noticed that the total amount of rain and melted snow in the two locations varied very little less than one ninety-fifth of the total amount in either city.

The greatest difference shown is in the monthly range between the maximum and minimum temperatures, where the variations run from maximum 7.2 degrees in May to minimum 0.3 degree in September. On the average the daily temperature was higher in the winter in Newport, and lower in the summer than the average daily temperature in Providence. These differences show that the fluctuations of temperature in Newport, the changes from heat to cold, are not so great in degree, and consequently a somewhat more equable and uniform climate is found in the southern than in the northern divisions of the State, according to the observations of 1880.

The prevailing direction of the wind modifies in a great measure the conditions of temperature, humidity and degree of change, and it is found by consulting the Tables that in the southern section of the State the prevailing direction has been from the southwest; in only one month during the year, *i. e.* March, has a northerly wind been most prevalent, while in the northern section of the State a northerly wind has been most prevalent during seven months of the year.

These differences in the direction of the wind have had their largest influences it would seem, judging from the mean annual temperature and rainfall of the two sections, in the production of greater extremes of heat and cold, in the sudden atmospheric changes of the northern divisions of the State.

A large number of interesting facts may be ascertained by a comparison of the various items presented in the Tables; but the principal object in collecting and preserving such tables is, after a sufficiently long period of years, to study the connections or various relations existing between certain forms of disease, and the degrees of temperature and moisture of the atmosphere. The State Board of Health must, at least for the present, depend on the voluntary aid of such institutions as furnished the above Tables for such observations.

## ANNUAL REPORTS OF MEDICAL CORRESPONDENTS.

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At the end of the year a blank circular was sent to each of the medical correspondents for a more comprehensive general report in relation to disease, presumable causes of disease, and the sanitary condition of localities during the preceding year in their respective circuits.

The following form of circular was sent for that purpose:

### CIRCULAR H.

OFFICE OF SECRETARY OF THE STATE BOARD OF HEALTH.

PROVIDENCE, Jan. 1, 1881.

*To Physicians :*

A year since it seemed desirable in addition, and supplementary to, the *Monthly* returns of regular correspondents, to obtain from all respectable physicians in every section of the State an Annual Report covering the whole twelve months preceding.

The following questions will indicate the information sought, and the general plan of such report; but correspondents need not be confined to precise replies to the questions presented, all the freedom being allowable of such modifications and additions, as the circumstances or peculiarities of each locality may seem to warrant.

These annual reports are desired for the purpose of presenting the status of the public health and the sanitary conditions existing in the different sections of the State, during the year 1880, in the Third Annual Report of the State Board of Health.

They should be returned to the Secretary of the Board by the second week in February.

Any additional postage stamps needed to cover postage on more extended consideration of the topics suggested, or any other topic having relation to the public health, will be immediately refunded on the receipt of papers.



## QUESTIONS.

1. Name of city or town, and circuit.
2. What has been the general amount of sickness, of all kinds, in your circuit in 1880, as compared with ordinary years? If greater or less, how much? Estimated.
3. What epidemics have prevailed in your circuit during the year 1880? If any, give the names in the order of their occurrence, in regard to date; the length of time they were prevalent; the degree of severity, and the localities where they prevailed.
4. What endemic diseases, if any, have been prevalent in your circuit during the year 1880? Please describe the peculiarities, if any, and the localities where they occurred.
5. What, in your opinion, is the probable cause, or causes of the endemics described?
6. What diseases of common occurrence, not strictly endemic nor contagious, have had an unusually large prevalence in your circuit during the year?
7. What contagious or infectious diseases have prevailed in your circuit, without becoming epidemic?
8. What diseases have been attended with an unusual fatality?
9. What circumstances have occurred within your observation or knowledge, that seemed to indicate that scarlet fever, diphtheria or typhoid fever had been taken, or communicated from one person to another? A full history of known facts in detail should be given. Such history need not be confined to any particular year. State on separate sheet.
10. What localities in your circuit do you consider peculiarly unhealthy? giving names and geographical position, and the diseases most prevalent, whether

endemic or otherwise, and what you consider the causes of the peculiar unhealthiness.

11. Have any changes been made, during the year 1880, in your locality, or any other locality having village characteristics, in your circuit, in relation to better drainage, more complete removal of excretæ, house refuse, garbage, &c., and have there been any other new measures, public or private adopted, to promote better sanitary conditions? State what, if any.

12. What influence, in your opinion, had the prolonged drouth of the last half of the year 1880, in the production or promotion of diseases? And, if any, in what manner, and of what diseases?

13. Has there been, in your opinion, any advance in the public sentiment of your circuit, in regard to the importance of sanitary surroundings; or any increased interest in questions appertaining to means of preventing diseases, and promoting individual and general health? State what reasons for belief.

14. Are there any localities in your circuit, which, without being considered generally unhealthy, are in your opinion promotive of pulmonary consumption, gravel, calculus, malarial or any other diseases? If any, state locality and form of disease.

Physicians receiving this circular, it is believed, will have the courtesy to fill the blank spaces between the questions in response to the same, and thus confer a favor on the State Board of Health, and show an interest in public sanitation by contributing from their knowledge, experience and observation, such statements of facts as have a practical bearing on the questions that underlie all investigation, into the causes and means of prevention of disease.

CHAS. H. FISHER, *Secretary*.

#### REPLIES TO CIRCULAR H.

The following reports, received from local correspondents of the medical profession in the several cities, towns and villages of the State, will give a good representation of the general status of the public health during the year 1880, as to the presence or absence of epidemics or endemics in the several locations, the sanitary conditions

and improvements, if any, in their several circuits, and other suggestions in response to the preceding circular:

BRISTOL COUNTY.

1. Warren and part of Barrington.
2. The general amount of sickness, of all kinds, within the limits of this town in 1880, as compared with ordinary years, has been about one-third less.
3. Malarial fevers prevailed in Barrington largely in September and October. No epidemics, to my knowledge, existed to any large extent.
4. None, unless the malarial fevers be so called that prevailed somewhat extensively in some parts of Barrington in September and October, about the brick yards and low grounds to the Providence river, occasioned, in my opinion, by filling up ponds of stagnant water and the dry and hot seasons for the last two or three years. Some persons had two or three attacks in succession.
6. No diseases of common occurrence, not strictly endemic nor contagious, have had an unusually large prevalence in this town during the year.
7. Very few contagious or infectious diseases have prevailed in this town during the year.
8. No diseases have been attended with an unusual fatality.
9. Scarlet fever occurred several times during the year 1880, but did not spread, probably owing to the great precaution taken. There were a few fatal cases during the year, but they did not have the malignant character that it has in some seasons.
11. No changes have been made, during the year 1880, in this town, in relation to better drainage, or more complete removal of excretæ, &c., and few, if any, new measures, public or private adopted, to promote better sanitary conditions.
12. The long drouths of last season produced, besides the malarial fevers already mentioned, typhoid tendencies or types in low cases of fever or slow fever.
13. I think sanitary measures are considered by this committee of great importance in warding off diseases, but not greatly practiced.
14. I know of no localities in this town which are particularly promotive of pulmonary consumption, gravel, calculus, malarial or any other diseases.

OTIS BULLOCK.

1. Warren ; Barrington and Bristol, in part.
2. The amount of sickness, of all kinds, in this circuit in 1880, as compared with ordinary years, has been a general average.
3. The epidemics that have prevailed in this circuit during the year 1880, or

diseases that may become such, are: 1st, intermittent fever; 2d, scarlet fever; 3d, whooping cough; 4th, typhoid fever. 1st, Barrington, surrounding Nayatt brick yards; 2d, Warren; 3d, Warren; 4th, Warren. 1st, severe; 2d, severe in a few cases; others not so severe; 3d and 4th, average. 1st, summer and autumn; 2d, fall and early winter; 3d and 4th, during the year in remote cases.

4. No endemic diseases have been prevalent in this circuit during the year, unless the intermittent fever at the Nayatt brick yards should prove to be such.

7. The contagious or infectious diseases that have prevailed in this circuit, without becoming epidemic, have not been very general, but cropped out in different families in sporadic cases.

8. No diseases have been attended with an unusual fatality.

9. The circumstances that have occurred within my observation or knowledge, during 1880, that seemed to indicate that scarlet fever, diphtheria or typhoid fever had been taken, or communicated from one person to another, are similar to the cases given in detail last year.

10. In Warren, the northerly part of town, in tenements of factory operatives, and carelessness in reference to filth thrown out, stagnant cess pools, &c.

11. No changes have been made, during the year 1880, in this locality, in relation to better drainage, more complete removal of excreta, house refuse, garbage, &c., except in the northerly part of the town. Some care was taken to renovate and cleanse that district by the mill corporation, but without much avail, as the foreign employees are peculiarly careless in respect to their surroundings.

12. The remarkable development of intermittent fever in Barrington was doubtless, in part, due to the prolonged drouth in 1880, especially as it lay bare extensive artificial pond tracts, causing much vegetable decomposition.

13. Very little, if any advance in public sentiment is shown in this circuit, in regard to the importance of sanitary surroundings; or increased interest in questions appertaining to means of preventing diseases, and promoting individual and general health.

14. No localities in this circuit, not generally unhealthy, are in my opinion promotive of pulmonary consumption, gravel, calculus, malarial or any other diseases, unless as stated above.

G. L. CHURCH.

#### KENT COUNTY.

1. East Greenwich, and parts of Warwick and North Kingstown.

2. The general amount of sickness, of all kinds, in my circuit, in 1880, as compared with ordinary years, is estimated at 10 per cent. below average.

3. No marked epidemics have prevailed here during the year.

4. A few cases of typhoid fever, supposed to have arisen from faulty household arrangements, but nothing very marked. No fatal cases.

5. Probably caused by accumulations in cesspool and privy vaults, or proximity of these to wells.

6. Of the diseases of common occurrence, not strictly endemic nor contagious, that have had an unusually large prevalence in my circuit during the year, influenza, catarrhal fever and pneumonia may be said to have predominated.

7. No contagious or infectious diseases have prevailed in this circuit.

8. No diseases have been attended with an unusual fatality.

9. In regard to circumstances that have occurred within my observation or knowledge, that seemed to indicate that scarlet fever, diphtheria or typhoid fever had been taken, or communicated from one person to another, I may say, the past year affords too few data for conclusions on this point. From experience in past years, the infection from all these diseases seems very much confined in virulence to families and circumscribed neighborhoods: but instances can be recalled where the first two have been transported by convalescents for many miles.

10. There are no localities in my circuit considered peculiarly unhealthy.

11. No changes have been made, to my knowledge, during the year 1880, in any locality in my circuit in relation to better drainage, more complete removal of excretæ, house refuse, garbage, &c., and there have been no new measures of prominence, public or private adopted, to promote better sanitary conditions.

12. I have not noticed that the prolonged drouth of the last half of the year 1880 had any influence in the production or promotion of diseases.

13. I think there has been but little advance in sentiment among officials of my circuit in regard to the importance of sanitary surroundings; or any increased interest in questions appertaining to means of preventing diseases, and promoting individual and general health.

14. I know of no localities in this circuit which, without being considered generally unhealthy, are promotive of pulmonary consumption, gravel, calculus, malarial or any other diseases.

J. H. ELDREDGE.

1. East Greenwich, and parts of Warwick, Coventry, West Greenwich, and North Kingstown.

2. The general amount of sickness, of all kinds, in 1880, as compared with ordinary years, was, by estimate, one-third less.

3. No epidemic has prevailed during the year.

4. No endemic diseases have been prevalent in my circuit during 1880.

6. There has not been an unusually large prevalence of any particular disease.

7. There have been a few cases of typhoid fever, and also of scarlet fever.

8. No particularly fatal diseases have occurred.

9. Have had only 8 or 10 cases of scarlet fever during the year. In 3 cases it seemed to be communicated directly from one child to another. In the other

cases they seemed to be sporadic. A few sporadic cases of diphtheria. Through August, September, October and November had a few cases of typhoid fever; two cases in one family, both sick at one time, and no evidence of communication in any of the cases.

10. No particularly unhealthy locality.

11. No changes or improvements have been made in relation to drainage or to promote better sanitary conditions, public or private.

12. I do not know of any particular influence that the prolonged drouth of the last half of the year 1880 had in the production or promotion of diseases.

13. There has been no advance in this direction.

14. There are no localities in my circuit which, without being considered generally unhealthy, are in my opinion particularly promotive of pulmonary consumption, gravel, calculus, malarial or any other diseases.

E. G. CARPENTER.

1. Warwick and Coventry, and villages on north and south branches of the Pawtuxet River.

2. The general amount of sickness, of all kinds, in my circuit in 1880, as compared with ordinary years, was about an average. In the early part of the year there was not much sickness: but in the fall, and summer particularly, it was quite sickly.

3. No epidemics have prevailed largely, as such, in this circuit during the year 1880. There were the usual summer complaints, not unusually severe, cholera infantum and diarrhoea; not much dysentery. In the latter part of the year, typhoid fever and scarletina prevailed to some considerable extent.

4. There were no endemic diseases prevalent as such in my circuit during the year 1880. The localities where they occur sometimes, are usually in manufacturing districts.

5. The causes probably are small and overcrowded tenements, heat and bad drainage and filth.

6. No diseases of common occurrence, not strictly endemic nor contagious, have had an unusually large prevalence in this circuit during the year, so far as I know.

7. The contagious or infectious diseases that have prevailed in the circuit are as follows: In the fall and early winter there has been some typhoid fever, and scarlet fever has been prevalent, especially in November and December, so much so that it might be called epidemic.

8. No disease has been attended with unusual fatality. Scarlatina has affected more adults than usual.

9. In regard to circumstances that have occurred under my observation or knowledge, that seemed to indicate that scarlet fever, diphtheria or typhoid fever

had been taken, or communicated from one person to another, I may remark that I have no doubt of the contagion from scarlet fever, and have seen nothing this year to change that opinion. I have some facts that would seem to militate against the contagion of typhoid. Of diphtheria I have seen but little this season.

10. There are some localities which I consider peculiarly unhealthy. I have found some places where typhoid fever showed itself that I supposed peculiarly healthy, but the fever was confined to this locality, and could only be accounted for by deeming that its germs came through drinking water. It was confined to two houses, which were isolated from the rest of the village, and were not in close proximity.

11. No changes have been made during the year, by the authorities or otherwise, in relation to better drainage or removal of excretæ, garbage, &c., and no other measures, so far as I know, public or private adopted, to promote better sanitary conditions.

12. The prolonged drouth of the last half of the year 1880 had no influence, so far as I know, in the production or promotion of disease.

13. I have seen no evidence of any advance in the public sentiment in regard to the importance of sanitary surroundings, or any increased interest in questions appertaining to means of preventing diseases, and promoting general health.

14. I regard the low and damp places along the rivers as peculiarly liable to diseases of the lungs and air passages, and occasionally diseases of malarial origin seem to affect those in such localities, though not more so this year than in other years.

J. KENYON.

#### NEWPORT COUNTY

1. Little Compton.
2. The general amount of sickness, of all kinds, in my circuit in 1880, as compared with ordinary years, has been two per cent. less
3. No epidemics have prevailed in this town during the year 1880.
4. No endemic diseases have been prevalent in this circuit during the year 1880.
6. The diseases of common occurrence, not strictly endemic nor contagious, that have had an unusually large prevalence in my circuit during the year are diarrhœa and catarrhal influenza. The latter has prevailed through the year.
7. No contagious or infectious disease has prevailed in this circuit, except scarlatina in sporadic cases.
8. The only disease that has been attended with an unusual fatality was Bright's disease of the kidneys.
10. All farms bordering upon the swamps and marshes I consider unhealthy; but, as a general rule here, there is but very little sickness that arises from that cause.

11. The farmers are very much more careful in the matter of removal of excreta, refuse and garbage, and the effect is seen in healthier children.

12. The influence of the prolonged drouth here was felt more by the old people and the children; but I cannot say that I think it produced or promoted any disease.

13. As to any advance in the public sentiment of this town in regard to the importance of sanitary surroundings, it may be said that from the appearances in my daily rides I can judge very truly that people here think and act more sensibly in a sanitary point of view. The slop-bucket is not emptied so frequently by the side of the well.

14. In regard to localities in this town, which, without being considered generally unhealthy, are in my opinion promotive of pulmonary consumption, gravel, calculus, malarial or any other diseases, I may say that cases of urinary gravel are very frequent around one locality in particular, viz.: Tuniper's pond. The reason I have been unable to explain as yet.

I. B. COWEN.

1. Tiverton.

2. The general amount of sickness, of all kinds, in this circuit in 1880, as compared with ordinary years, has been about fifteen per cent. greater.

3. No special epidemics have prevailed during the year. During the last two months of the year measles have prevailed, especially in School Districts Nos. 1, 3, 4 and 12; a few severe cases, but mostly mild to average.

4. No endemic diseases have been prevalent in my circuit during the year.

6. No diseases of common occurrence, not strictly endemic nor contagious, have had an unusually large prevalence in this town during the year.

7. The contagious or infectious diseases that have prevailed in this circuit, without becoming epidemic, are scarlet fever, typhoid fever and dysentery.

8. No diseases have been attended with an unusual fatality.

9. As to circumstances that have occurred within my observation or knowledge that seemed to indicate that scarlet fever, diphtheria or typhoid fever had been taken, or communicated from one person to another, I relate the following cases in regard to scarlet fever: A lad from Fall River on a visit to an aunt came down with the disease. In due time all the other children (3) were taken sick, one of which died of the disease. The disease in this instance was confined to the family, strict quarantine being observed. Also other cases where strict quarantine was not enforced, and the disease spread into two or three families, which, being quarantined, the disorder was suppressed.

11. Not any.

12. Diarrhoeal diseases of children seemed to be prolonged and more severe during the drouth than before.

13. The people of this town with but few exceptions are not specially informed in sanitary improvements.



14. It is an almost prevailing custom to use well water, many of which are brackish and contain mineral substances. I am inclined to consider such waters as promotive of gravel, calculi, etc., of which disorders we have occasional cases. A few families use filtered cistern water.

E. P. STIMSON.

1. Newport.
2. There has been a slight increase in the general amount of sickness during 1880 over the previous three years.
3. During the fall of 1880 there was a slight epidemic of scarlet fever, all the cases being of a very mild character. During the last three months of the year there was a wide-spread epidemic of measles, the disease attacking the old as well as the young.
4. Answered in No. 3.
5. The scarlet fever cases were confined chiefly to the children attending one of the schools, and arose from a case imported into the city.
6. Rheumatism.
7. Diphtheria, pertussis, typhoid fever and dysentery.
8. There has been no unusual fatality attending any of the prevailing diseases.
9. A slight epidemic of scarlet fever existed during the fall. A case was imported into the city, and from this spread chiefly among the children attending a private school; cases all of mild character.
10. The thickly settled portions of the city, particularly along the harbor front. The unhealthiness is caused chiefly by defective drainage and bad water.
11. No improvement has been made during the past year in relation to better drainage. The removal of excretæ, house refuse and garbage is conducted in a manner detrimental to the public health, and the city authorities allow the refuse and garbage from the houses to be gathered in the same cart with the ashes and to be dumped on the harbor front to fill in for dockage.
12. During the dry season of the summer dysentery prevailed to a greater extent than at any time during the previous five years. The cases were generally very severe and of long duration, but not very fatal.
13. The importance of having better sanitary conditions for our city is being felt by the community, and the public sentiment is in favor of establishing a board of health. The inefficient manner in which the health ordinances are enforced, and the countenancing by the city officials of certain nuisances, has excited a lively interest among the citizens of Newport, as shown by the local papers, and created a demand for the establishment of a board of health for the city.

F. H. RANKIN.

## PROVIDENCE COUNTY.

## 1. Pascoag, Burrillville.

2. The general amount of sickness, of all kinds, in this circuit in 1880 has been very large, as compared with ordinary years. Seventy-five per cent. larger at least, and probably nearer 100.

3. Diphtheria prevailed very extensively during the autumn months, and in the northern part of the town was very fatal.

4. No endemic diseases have been prevalent in my circuit during the year 1880.

6. The disease of common occurrence, not usually endemic nor contagious, that has had an unusually large prevalence in this town during the year is typhoid fever.

7. No contagious or infectious diseases have prevailed to any extent in this town without becoming epidemic.

8. Diphtheria has been attended with an unusual fatality during the latter months of the year.

10. The northern part of the town was very unhealthy during the autumn on account of the low state of water.

11. No changes have been made, during the year 1880, in my locality, or any other locality to my knowledge, in my circuit, in relation to better drainage, more complete removal of excretæ, house refuse, garbage, &c., and I know of no new measures, public or private adopted, to promote better sanitary conditions.

12. I think that the prolonged drouth of the last half of the year had very great influence in the production and promotion of diseases.

13. I am not sure of any advance in the public sentiment of my circuit in regard to the importance of sanitary surroundings; or any increased interest in questions appertaining to means of preventing diseases.

H. J. BRUCE.

## 1. Harrisville, Burrillville.

2. The general amount of sickness, of all kinds, in this town in 1880, as compared with ordinary years, has been estimated at 100 per cent. or more greater.

3. We have had an epidemic of diphtheria; has prevailed for the past three or four months; still prevails, though to a modified extent; most extensive and fatal in the northern portion of the town, in and about Pascoag and Harrisville.

4. No endemic diseases prevalent in my circuit during the year 1880.

6. No diseases of common occurrence, not strictly endemic nor contagious, have had an unusually large prevalence in my circuit during the year.

7. The contagious or infectious diseases that have prevailed in my circuit, without becoming epidemic, are scarlet fever and measles.

8. Diphtheritic cases have been attended with an unusual fatality.

9. Two years ago we had a slight epidemic of scarlet fever in which the contagion was traced directly to the Quaker school at Providence. This year the first case of diphtheria I saw, and in fact the *first case that appeared in the town*, as I am able to learn, was traced directly to a fatal case in Olneyville. The young girl attended the funeral of a child who died of diphtheria at Olneyville, returned home, and in a few days was herself attacked by the disease. Soon neighbors' children began to suffer from the complaint, and in a few weeks the disease became general in that part of the town.

10. There are no localities in my circuit that I consider peculiarly unhealthy in comparison with others.

11. No movements of town authorities or otherwise that I know of have been made, during the year 1880, in this town in relation to more complete removal of excreta, house refuse, &c., or to promote better sanitary conditions.

12. I think the prolonged drouth of the last half of the year 1880 must have had some influence in the production or promotion of diseases. Just what effect would be impossible to state; but all acute diseases have been unusually severe and fatal.

13. If there is any advance in the public sentiment in regard to the importance of sanitary surroundings, or any increased interest in promoting individual and general health, it has not been made apparent. Burrillville has made no advance in this or any other direction. Any improvement that involves the outlay of a single dollar, even if of the greatest public good, would not be entertained for a moment.

14. I know of no localities in my circuit, which, without being generally unhealthy, are particularly promotive of pulmonary consumption, gravel, calculus or malarial diseases.

E. V. GRANGER.

1. Valley Falls and parts of Cumberland, Lincoln and Pawtucket.
2. The general amount of sickness, of all kinds, in my circuit in 1880, as compared with ordinary years, has been about the same—perhaps a little less.
3. No epidemics have prevailed in this neighborhood during the year.
4. No endemic diseases have been prevalent during the year.
6. The diseases of common occurrence, not strictly endemic nor contagious, that have had an unusually large prevalence in this section during the year are diarrhœa and bronchitis.
7. The contagious or infectious diseases that have prevailed without becoming epidemic are scarlet fever, measles and whooping cough.
8. There has been a large fatality among the aged and those affected with general debility.
10. I have no knowledge of any localities that I consider peculiarly unhealthy. Valley Falls is salubrious in all its parts.

11. No changes have been made, during the year 1880, in any locality in this section in relation to better drainage or more complete removal of excretæ, house refuse, &c., and no new measures of consequence, public or private adopted, to promote better sanitary conditions.

12. In regard to the influence the prolonged drouth of the last half of the year had in the production or promotion of diseases, I can only say that there was an unusually small amount of typhoid fever last fall, which I thought might be due to the severe drouth. Sickness generally diminished.

13. There has been no marked degree of interest or change of sentiment perceived in regard to sanitary improvement or any means of preventing disease.

14. In regard to localities in this section not generally unhealthy, which seem to be promotive of pulmonary consumption, gravel, calculus or malarial diseases, I may say that I know of no localities where the diseases mentioned, or any other diseases, are unusually prevalent. The cases that have occurred here in the last year have only presented the usual characteristics of ordinary sporadic cases generally met with.

G. B. HAINES.

1. Foster.

2. The general amount of sickness, of all kinds, in this circuit in 1880, as compared with ordinary years, has been about one-third less.

3. No epidemics have prevailed in this town during the year 1880.

4. No endemic diseases have been prevalent in my circuit during the year.

6. No diseases of common occurrence, not strictly endemic nor contagious, have had an unusually large prevalence in this town during the year, unless mild diarrhoea be excepted.

7. The contagious or infectious diseases that have prevailed in my circuit without becoming epidemic are scarlet fever, typhoid fever and diphtheria.

8. No diseases have been attended with an unusual fatality.

9. Two cases of scarlet fever occurred in one house, with sore throat; very severe; both lived. Free intercourse was had, and no others had it. I had a very severe case of scarlet fever and severe ulcerations of the throat; *very sick and doubtful case*. By mistake the nurse gave a teaspoonful of a strong liniment composed of camphor, aqua ammonia strong and thirty-five parts of alcohol, without water, milk or other liquid. Result: vomited in a few minutes and cleared the throat completely; thirsty the next twenty-four hours; appetite the next day good; the nose discharged bloody matter for a month; two cases in this family; kept *solitary*; spread not. Five cases in one family; one death; spread not.

10. There are no localities in my circuit that I consider peculiarly unhealthy.

11. No changes have been made, during the year 1880, in this town to promote better sanitary conditions.

12. I have not seen any evidence of any influence the prolonged drouth of the last half of the year had in the production or promotion of diseases.

13. There has been no advance in the public sentiment of this town that I know of in regard to the importance of sanitary surroundings, or means of preventing diseases and promoting general health.

14. There are no localities that I know of that are promotive of pulmonary consumption, gravel, calculus, malarial or any other diseases more than common.

M. P. ARNOLD.

1. Lincoln and Pawtucket.

2. The general amount of sickness, of all kinds, in this section in 1880, as compared with ordinary years, has been less.

3. No epidemics except toward the close of the year. We had measles of a light type continuing into 1881. Some scarlet fever and diphtheria all through the year, but not epidemic.

4. No endemic diseases have been prevalent during the year 1880.

6. Among the diseases of common occurrence, not strictly endemic nor contagious which have had large prevalence in this section during the year, may be named influenza.

7. The contagious or infectious diseases that have prevailed without becoming epidemic are scarlet fever and diphtheria.

8. No diseases have been attended with an unusual fatality.

9. I don't believe in the contagion of scarlet fever or typhoid, and have doubts of diphtheria.

11. No changes have been made to my knowledge by the authorities during the year 1880 in relation to better drainage, more complete removal of excreta, house refuse, garbage, &c., or any other new measures, public or private adopted, to promote better sanitary conditions.

12. In regard to the influence the prolonged drouth of the middle or last half of the year 1880 had in the production or promotion of diseases, I know of no effect unless to lessen the tendency. The drouth commenced in April and May, as we had no spring rains in this section.

13. The *advance* in public sentiment in regard to the importance of sanitary surroundings, or increased interest in questions appertaining to means of preventing diseases and promoting general health have not been very noticeable.

14. I have no knowledge of any localities not considered generally unhealthy that are particularly promotive of pulmonary consumption, gravel, calculus, malarial or any other diseases.

A. A. MANN.

1. Johnston, North Providence and Smithfield.

2. The general amount of sickness, of all kinds, in this circuit in 1880, as

compared with ordinary years, has been about an average—if anything a little less.

3. Scarlet fever prevailed in the spring for a period of about two months. The type was severe, many of the cases being affected with alarming throat symptoms, in Manton, Lymanville, Centredale and Georgiaville.

4. No endemic diseases have been prevalent in this circuit during the year 1880.

6. No diseases of common occurrence, not strictly endemic nor contagious, have had an unusually large prevalence during the year.

7. The contagious or infectious diseases that have prevailed in this circuit without becoming epidemic are diphtheria and typhoid fever.

8. No diseases have been attended with an unusual fatality.

9. In January was called to see a child aged four years. No other family is living within a quarter of a mile of the house. He was suffering from articular rheumatism. About two weeks before, the child was suddenly seized with high fever and vomiting. This was followed by an extensive rash, or, as the mother called it, "broke out all over." Only slight evidences of desquamation could be found. As the articular pains subsided extensive cedema of the face developed, the urine became scanty, high-colored and full of albumen; without doubt a case of scarlatina, followed by rheumatism and dropsy. About this time a younger brother, eighteen months old, who had not been away from the house, was seized with high fever and vomiting. He had the inflamed and swollen throat, strawberry tongue, but no rash. He rapidly went into a state of collapse, and succumbed in forty hours.

10. There are no localities in this section peculiarly unhealthy.

11. In regard to changes that have been made, during the year 1880, in this section, in relation to better drainage, or more complete removal of excreta, garbage, &c., and other measures to promote better sanitary conditions, we think we have seen greater cleanliness on the part of the people about their homes. The introduction of Pawtuxet water into Dyerville is an improvement. Some of the wells were so situated as to receive drainage from the houses.

12. In relation to the influence the prolonged drouth of the last half of the year had in the production or promotion of diseases, it may be said that, contrary to expectation, no influence could be observed. It looked at one time as if we would have an epidemic of typhoid, but none occurred.

13. There seems to have been some advance in the public sentiment in regard to the importance of sanitary surroundings and means of preventing diseases.

14. As to localities in this section which are evidently promotive of pulmonary consumption, gravel, calculus, malarial or any other diseases, we have no reason for thinking any such locality exists.

J. C. BUDLONG,  
C. A. BARNARD.

1. Olneyville, Johnston, parts of Cranston and North Providence.

2. The general amount of sickness, of all kinds, in 1880, as compared with ordinary years, has been about one-fourth larger.

3. The epidemics and contagious diseases that have prevailed in this circuit during the year 1880 are as follows: Pertussis, mild, from January to August, Olneyville. Diphtheria, average to severe about every month; severe October to December. Scarlet fever, average to severe from September to December 31st, Merino and Morgan Mills. Measles, mild, May to October, Silver Lake, Simmonsville. Influenza, severe, October to December; general about town. Rotheln, mild, October to December, Olneyville.

4. The endemic diseases that have been prevalent in this circuit during the year 1880 are dysentery, Simmonsville. Typhoid fever generally confined to the manufacturing districts, and Irish people. Rheumatism is increasing in the swamp district back of Olneyville.

5. The probable causes of the occurrence as endemics are, I think, as follows: Typhoid, caused probably by imperfect drainage and carelessness as to cleanliness; certain districts on Mt. Pleasant are fruitful of the disease. Rheumatism, in low, marshy and damp settlements south of village proper.

6. The diseases of common occurrence, not strictly endemic nor contagious, that have had an unusually large prevalence in this circuit during the year are rheumatism, not strictly endemic; see above; lung diseases, apoplexy, heart disease, cholera infantum.

7. The contagious or infectious diseases that have prevailed in this circuit without becoming epidemic are mumps, here and there a case; chicken pox, few cases; membranous croup.

8. The diseases that have been attended with an unusual fatality are cholera infantum and diphtheria.

9. The following circumstances have occurred within my observation that seemed to indicate that scarlet fever had been taken or communicated from one person to another: Case at Merino—A young married lady from East Greenwich visited a relative at Merino about the middle of December, where there was a child sick with scarlet fever; very light. She stayed one night and went directly home, and was to return again when the child recovered. She had two children herself, but they were left at home the first visit. In about ten days she returned, bringing her little girl with her, and the same night this child was taken sick, showing unmistakable signs of the scarlet fever. Next day eruption decided the same. Hence we suppose, as the mother knew of no cases at home, and the time of the first and second visit, that she carried the disease home with her.

10. The localities in this circuit I consider unusually unhealthy are as follows: The "swamp district," just back of the village, very damp and wet: typhoid, diphtheria, rheumatism, cholera infantum. The Riverside district: diphtheria, croup. The Merino district: all but the first are owing to carelessness as to clean habits.

11. The main sewer pipe in the principal streets has been changed for a larger pipe, and the surplus water is now entirely flowed out. The swamp lands have

been filled in in some places with sand. The Riverside authorities have posted orders for better care of tenements. No public orders have been issued.

12. In regard to the prolonged drouth of the last half of the year 1880, I think it had much to do in promoting lung and enteric diseases; besides it gave an impulse to influenza.

13. The people have, I think, considered the subject more than before, and I believe they are doing so every year. I think they are beginning to wake up to the importance of healthy surroundings.

14. The locality which is considered generally unhealthy, and in my opinion promotive of pulmonary consumption, is the swamp district. Had six cases of consumption there, and only one outside, in same area and population.

G. R. FISHER.

1. Pawtucket and Lincoln.

2. The general amount of sickness, of all kinds, in this section in 1880, as compared with ordinary years, has been about an average.

3. Scarlet fever has prevailed to some extent as an epidemic.

4. No endemic diseases have been prevalent in this circuit during the year 1880.

6. No diseases of common occurrence, not strictly endemic nor contagious, have had an unusually large prevalence during the year.

7. No contagious or infectious diseases have prevailed without becoming epidemic, unless exception be made of diphtheria and measles.

8. No disease has been attended with an unusual fatality, except scarlet fever.

9. Diphtheria and scarlet fever seem contagious, but not more so than usual, or in any way different.

10. There are no localities in my circuit that I consider peculiarly unhealthy.

11. No unusual changes have been made, during the year, in this locality in relation to better drainage, more complete removal of excretæ, house refuse, garbage, &c., or any other new measures, public or private adopted, to promote better sanitary conditions, except in extension of water supply.

12. As to the influence of the prolonged drouth of the last half of the year in the production or promotion of diseases, I know of none except that it probably lessened typhoid fever.

13. I think there has been no advance in the public sentiment of this place in regard to the importance of sanitary surroundings nor any increased interest in questions appertaining to means of preventing diseases.

14. As to any localities particularly promotive of pulmonary consumption, gravel, calculus, malarial or any other diseases, we may infer that the east side of the river, in Pawtucket, may be more unhealthy, from the fact that it has a wet soil. Cannot say that such is the fact.

J. O. WHITNEY.



1. Pawtucket.

2. The general amount of sickness, of all kinds, in this vicinity in 1880, as compared with ordinary years, was not quite as much as usual, or perhaps an average. No reliable estimate.

3. Measles have been very prevalent; of ordinary severity, and not confined to any particular localities.

4. No endemic diseases have been prevalent during the year 1880.

6. No diseases of common occurrence, not strictly endemic nor contagious, have had an unusually large prevalence during the year.

7. No contagious or infectious diseases have prevailed, without becoming epidemic, except scarlet fever.

8. No diseases have been attended with unusual fatality.

10. There are several localities, scattered over town, particularly caused by filth and defective drainage.

11. No changes have been made during the year 1880, in this vicinity, in relation to better drainage, or more complete removal of excreta, house refuse, nor any other measures, public or private adopted, to promote better sanitary conditions, except completion of water works.

12. I know of no effect that the prolonged drouth of the last half of the year had in the production or promotion of diseases, unless by increasing diseases of a malarial type

13. I think there is some advance in the public sentiment of this section in regard to the importance of sanitary surroundings, and some increased interest in questions appertaining to means of preventing diseases, and promoting general health.

14. There are a few localities in this section which I think may be promotive of pulmonary consumption and malarial diseases, especially where the location is low and moist, contiguous to imperfectly drained marshes.

G. H. STANLEY.

1. Northern half of Scituate, and parts of Johnston, Smithfield, Gloucester and Foster.

2. The general amount of sickness, of all kinds, in this circuit in 1880, as compared with the last two years, has been at least ten per cent. increase.

3. Typhoid fever in No. Scituate and vicinity. Hooping cough commenced in October, and prevailed during the remainder of the year. It affected chiefly the residents of No. Scituate and Saundersville, and did not spread into surrounding territory.

4. No cases of endemic disease are known to have occurred during the year. In the Mill Village, at No. Scituate, there were at one period a few cases (two or three only) of fever possessing malarial characteristics, and which succumbed promptly to large doses of quinine, after being unaffected by other remedies.

6. The diseases of common occurrence, not strictly endemic nor contagious, that had an unusually large prevalence in my circuit during the year were cholera infantum, dysentery and diarrhoea. Cholera morbus was exceptionally prevalent during the hot months.

7. The contagious or infectious diseases that prevailed in my circuit, without becoming epidemic, were diphtheria and scarlet fever.

8. No diseases have been attended with an unusual fatality.

10. I know of no locality in my circuit which from natural causes I should consider unhealthy. The drainage in the New Pond Factory Village was very bad last season, and in my opinion contributed largely to the very unusual prevalence of typhoid fever in that locality.

11. No changes of consequence have been made during the year 1880 in this locality in relation to better drainage, or more complete removal of excretæ, &c., and no other measures, to my knowledge, public or private adopted, to promote better sanitary conditions.

12. Did not discover any particular influences which could properly be ascribed to drouth, unless the very low state of wells, assisted by poor drainage, in the production of typhoid fever. Possibly the subsidence of soil water gave the opportunity for greater chemical change, and decomposition of vegetable matter in the soil, and thus contributed to low forms of disease.

13. Do not think there has been much advance in the public sentiment in regard to the importance of sanitary surroundings, or increased interest in questions appertaining to means of preventing diseases, and promoting individual and general health.

14. No localities are known to me which, without being considered generally unhealthy, are promotive of pulmonary consumption, gravel, calculus, malarial or any other diseases.

W. J. SMITH.

1. Woonsocket, Cumberland and North Smithfield.

2. There has been about the average amount of sickness, taking the whole year together.

3. January to March (last of March), influenza—since about that time measles. Scattering cases of scarlet fever and of diphtheria have occurred during the whole year, but they did not become epidemic.

4. No endemic diseases have been prevalent in this circuit during the year 1880.

6. No diseases of common occurrence, not strictly endemic nor contagious, have had an unusually large prevalence during the year.

7. The contagious or infectious diseases that have prevailed in this circuit, without becoming epidemic, are scarlet fever and diphtheria

8. Scarlet fever has, especially during the first half of the year, been unusually fatal.

9. I have no cases that indicate such communication to the exclusion of the hypothesis of common origin.

10. I may remark, in regard to localities in my circuit peculiarly unhealthy, that I consider the Hamlet to be favorable to the development of phthisis, and the Social village also, but in a less degree

11. No changes to any extent have been made, during the year 1880, in this vicinity in relation to better drainage, more complete removal of excretæ, &c.

12. Whether the prolonged drouth of the last half of the year had any influence in the production or promotion of diseases, I have not been able to form any decided opinion.

13. There appears to me to be more general interest in, and knowledge of, sanitary matters gradually growing in this community.

14. I am not aware of any localities in this vicinity peculiarly promotive of pulmonary consumption, gravel, calculus, malarial or any other diseases, except as stated above.

D. M. EDWARDS.

WASHINGTON COUNTY.

1. Hopkinton, Richmond and part of Exeter.

2. The general amount of sickness, of all kinds, in my circuit in 1880, as compared with ordinary years, has been about an average.

3. Scarlet fever has been epidemic in this section for the whole year. It has been of a mild grade, although considerable secondary trouble has followed it.

4. No endemic diseases have been prevalent in my circuit during the year.

6. No diseases of common occurrence, not strictly endemic nor contagious, have had an unusually large prevalence during the year.

7. No contagious or infectious diseases have prevailed in this circuit without becoming epidemic, except hooping cough.

8. No diseases have been attended with an unusual fatality, but many old people have died.

9. I had six cases of typhoid fever in one family, residing in the country, a fourth of a mile from any other neighbor. The house was situated upon rising ground, and surroundings healthy so far as the buildings were concerned. It might be attributed to the low water and exposed surface of a reservoir one-half of a mile away. *All recovered.*

10. There are no localities in this circuit that I consider peculiarly unhealthy.

11. No changes have been made, during the year 1880, in this vicinity in relation to better drainage, or removal of excretæ, house refuse, &c., and no new measures, public or private adopted, to promote better sanitary conditions, so far as I know.

12. In regard to the influence of the prolonged drouth of the year 1880 in the production or promotion of diseases, I think, as a rule, there was less sickness, of all kinds, than usual.

13. I have observed no advance in the public sentiment of this section in regard to the importance of sanitary surroundings, or any increased interest in means of preventing diseases and promoting health.

14. Do not know of any localities in this circuit which, without being considered generally unhealthy, are promotive of pulmonary consumption, gravel, calculus, malarial or any other diseases.

E. P. CLARK.

1. Hopkinton, northern part of Westerly, northern part of Charlestown, and southern part of Richmond.

2. The amount of sickness has been greater, I should think, by twenty per cent.

3. We have had no epidemics during the past year, in a strict sense of the word, unless scarlet fever may have reached that point at one time.

4. There was what might be called a slight endemic of typhoid fever in the northern part of the town of Hopkinton during August and September—most cases occurring in high and dry localities. There was also a good many cases of dysentery in the same locality at the same time.

5. Most cases of typhoid, if not all, were traceable to bad drainage.

6. The diseases of common occurrence, not strictly endemic nor contagious, that have had an unusually large prevalence in this circuit during the year, are typhoid fever, catarrhal troubles of intestines and pulmonary diseases.

7. The contagious or infectious diseases that have prevailed in my circuit, without becoming epidemic, are typhoid, scarlet fever and diphtheria.

8. No diseases have been attended with an unusual fatality.

10. The village of Niantic I consider to be, and is very unhealthy, on account of bad drainage; also in the way cess-pools are located, and out-houses many times in close proximity to the wells, and in some instances even allowing a surface drainage into the well.

11. No changes have been made, during the year 1880, in this vicinity to my knowledge, in relation to better drainage or removal of excretæ, house refuse, &c., or any other measures, public or private adopted, to promote better sanitary conditions.

12. In regard to the influence the prolonged drouth of the last half of the year 1880 had in the production or promotion of diseases, it was within my observation that there was a marked increase of infectious diseases following the first heavy rains, viz.: typhoid fever and dysentery. The fault was probably in the water, as many of the wells were very low, and some dry; after the first heavy rains we had, wells that had been dry for weeks contained three feet of water within twenty-four hours.

13. Very little advance, if any, in the public sentiment in this section in regard to the importance of sanitary surroundings, or interest in means of preventing diseases and promoting health.

14. Do not know of any localities in this circuit which, without being generally unhealthy, are promotive of pulmonary consumption, gravel, calculus, malarial or any other diseases, although there has been a marked increase of pulmonary diseases during the past year in my circuit, especially consumption. It has not been confined to any one locality.

A. B. BRIGGS.

1. South Kingstown.

2. The general amount of sickness, of all kinds, in this circuit in 1880, as compared with ordinary years, is about twenty-five per cent. less.

3. No epidemics have prevailed to any extent during the year 1880. A very few isolated cases of typhoid fever in the fall of 1880, and a few cases of diphtheria, confined to the Tower Hill locality, and one family at Narragansett Pier.

4. No endemic diseases have been prevalent in this circuit during the year 1880.

6. No diseases of common occurrence, not strictly endemic nor contagious, have had an unusually large prevalence during the year.

7. The contagious or infectious diseases that have prevailed in this circuit, without becoming epidemic, are scarlet fever and diphtheria.

8. No diseases have been attended with an unusual fatality.

9. Scarlet fever I believe to be contagious, both from contact and infection. Diphtheria and typhoid fever have, in my experience, been endemic, confined in the main to the households where they originated. I have never seen either prevail as an epidemic. Scarlet fever, I certainly think, I have seen epidemic in several instances.

10. There are no localities in this circuit peculiarly unhealthy.

11. No important changes have been made during the year 1880, by the authorities or otherwise, in this circuit in relation to better drainage or more complete removal of excretæ, garbage, &c. I know of no new measures, public or private adopted, to promote better sanitary conditions.

12. I have not noticed any influence that the prolonged drouth of the last half of the year had in the production or promotion of diseases.

13. I know of no advance in the public sentiment of my circuit in regard to the importance of sanitary surroundings; or increased interest in means of preventing diseases, and promoting general health. The situation and surroundings of this entire town are conducive to health and longevity. Infectious diseases are generally very benign in character and manageable in their treatment.

14. There are no localities in my circuit which are peculiarly promotive of pulmonary consumption, gravel, calculus, malarial or any other diseases. Some of the grounds about Narragansett Pier are naturally wet and without suitable drainage, and they are very thickly inhabited for two months of the year. Those who come to them are generally in good health, and do not seem to suffer. The permanent residents do not seem to be affected by it; why they are not, I cannot say.

C. E. MARYOTT.

1. Charlestown and Richmond.

2. The general amount of sickness, of all kinds, in my circuit in 1880, as compared with ordinary years, was twenty five per cent. more, credited to the last half of the year.

3. No epidemics of contagious diseases have prevailed in my circuit during the year 1880. Catarrhal influenza has been prevalent from early autumn throughout the year, of rather more than average severity, and very general.

4. Remittent fever has prevailed to some extent throughout my circuit, of average severity, but especially in the villages of Shannock and Kenyon's Mills.

5. In my opinion, the probable cause, or causes of the endemics described are clearly of a miasmatic origin. These two villages are the first below "Great Swamp," so called, at the head of Pawcatuck River.

6. No diseases of common occurrence, not strictly endemic nor contagious, have had an unusually large prevalence during the year.

7. No contagious or infectious diseases have prevailed in my circuit without becoming epidemic.

8. No diseases have been attended with an unusual fatality.

9. From January 1 to December 14, 1873, there had not been a case of scarlet fever in my circuit. December 14, 1873, I was called to see a little girl about two years old, living at Kenyon's Mills, two miles distant from my place of business. Found her sick with scarlet fever, which in a short time assumed the malignant form. On the 16th, another child of the same family, aged four years, was taken with the same disease. The child first taken died December 25, and the second child died the 29th. December 23, one of my own children, aged five years, and December 25, another child, one year old, were taken sick with same disease. One died January 4, and the other January 6. January 10, a young lady, aged 23, living with Mrs. G., who had been a very frequent visitor and attendant to and upon my children during their sickness, and who lived on the same street, about one-eighth of a mile distant, was taken sick with the same disease, and died the 24th. The young lady had never visited my house. These were the only cases that occurred. I have no doubt that I communicated the disease from the first cases to my own children, and the neighbor visitor, Mrs. G., to the young lady inmate of her family. In the autumn of 1869, typhoid fever appeared at Kenyon's Mills, a small manufacturing village of about 200 inhabitants, situated upon Pawcatuck River, about two miles below Great Pond and Great Swamp. The pond is very shallow, averaging not over four feet in depth, and produces a large growth of water rushes. The swamp is partially submerged with water in winter, spring and early summer, and becomes dry in late summer and early autumn, under ordinary circumstances. It produces a very rank growth of vegetation. The pond and swamp cover an area of five or six thousand square acres. The village is situated on the north bank of the river, with a street running parallel to it, and a row of tenement and boarding houses on each side of street. There are two wells of water on the bank of river in rear of houses, and one on the opposite side of street, well removed back. There were seven original cases of fever, and in every instance among those who had habitually used water from the

wells on the bank of river. Five of these cases were non-residents of the village, and went to their respective and separate homes, when compelled to leave work in first stage of disease. In every instance but one, other cases of fever occurred in the families where were the original sick ones. In an aggregate of about twenty-five cases of typhoid fever in my circuit that fall, every one was traceable to the seven original cases. Three proved fatal.

10. There are some localities in my circuit that I consider peculiarly unhealthy. The territory adjacent to Pawcatuck River, from the village of Shannock to its source in Worden's Pond, and the Great Swamp. Typhoid and remittent fevers and diphtheria. Miasmatic emanations, are doubtless among the causes.

11. Considerable changes have been made during the year 1880 by A. Carmichael & Co. at the Shannock Mills, in relation to better drainage and more complete removal of excretæ, house refuse, garbage, &c. Do not know of any other measures of consequence, public or private adopted, to promote better sanitary conditions.

12. The influence that the prolonged drouth of the last half of the year had in the production or promotion of diseases was, I think, principally miasmatic, caused by low stages of water in swamps, reservoirs, and streams, impure drinking water, producing fevers and diseases of mucus membranes.

13. No perceptible advance in the public sentiment of this circuit in regard to the importance of sanitary surroundings; or means of preventing diseases, and promoting health. A few individuals are awake to sanitary requirements.

14. Answered under No. 10.

A. A. SAUNDERS.

1. Westerly.

2. The general amount of sickness in my circuit in 1880, as compared with ordinary years, was about an average, taken all together.

3. No epidemics have prevailed in this town during the year 1880. Diphtheria has been quite prevalent in this community since early in the fall. I do not, however, consider it has reached an epidemic prevalence.

4. During part of July, August and September, a mild form of malaria occurred in one part of my circuit. The locality was surrounded by low, wet, marshy lands, with quite a luxuriant growth of vegetation. Malaria was almost unheard of before in this locality.

5. In my opinion, the probable cause of the endemic described was the same poison which produces malaria elsewhere.

6. In regard to diseases of common occurrence, not strictly endemic nor contagious, there were more cases of dysentery last summer than usual.

7. The contagious or infectious diseases that prevailed in my circuit, without becoming epidemic, during the year, were diphtheria and scarlet fever.

8. No diseases have been attended with an unusual fatality, unless it may be

scarlet fever. We have not had many cases, but what we have had have proved unusually fatal.

9. From careful observation during a practice of ten years, I am satisfied of the contagiousness of scarlet fever, diphtheria and typhoid fever. In my opinion, the contagiousness of scarlet fever is confined more to the age of childhood; but no age is exempt from the ravages of diphtheria. In a country practice, we have cases of sporadic typhoid fever, which do not seem to be very contagious.

10. The only localities in my circuit that I consider peculiarly unhealthy are described under question No. 4.

11. The drainage of Westerly has been improved during the past year to some extent by grading of streets, laying sewer pipes, &c. Several of our real estate owners have adopted better methods of disposing of house refuse, care of sink drains, cesspools, &c.

12. If the prolonged drouth of the last half of the year had any detrimental influence in the production of diseases, it was only manifest by an increase of cases of dysentery and diphtheria. During the six months, taken together, I think we had a less amount of sickness than is usual for us. Our loss in dysentery and diphtheria was more than equalled by our gain in not having as many cases of typhoid fever and remittent fever as usual.

13. I think the better class of our community are advancing as to the importance of their sanitary surroundings. They are asking what they should do. The spirit of inquiry is increasing. Daily observations are my reasons for the above belief.

14. There are no localities in my circuit which are peculiarly promotive of pulmonary consumption, gravel, calculus, malarial or any other diseases, except the one locality where malaria seemed to develop itself last summer, and that for the first time.

H. N. CRANDALL.



## REPORTS FROM TOWNS.

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At the January session of the General Assembly in 1880, the following section of chapter 794 was enacted in addition to chapter 680 of the Public Laws:

### CHAPTER 794.

SECTION 3. The Secretary of the said Board shall make inquiry from time to time, of the clerks of town and local boards of health, in relation to the prevalence of any disease, or knowledge of any known or generally believed source of disease, or causes of general ill-health, and also in relation to the proceedings of the said boards of health, in respect to acts for the promotion and protection of the public health, and also in relation to diseases among domestic animals, in their several towns and localities, respectively; and the said clerks of town and local boards of health, shall give such information, in reply to said inquiries, of such facts and circumstances as have come to their knowledge.

The following circular was therefore sent to the town clerks of the several towns, acting as clerks of boards of health:

### CIRCULAR I.

#### OFFICE OF SECRETARY OF THE STATE BOARD OF HEALTH.

PROVIDENCE, Jan. 1, 1881.

*To the Town Clerk of the Town of ———:*

At the beginning of the year 1880 a circular was sent to the clerks of local boards of health (town councils or boards of aldermen, unless special boards are appointed,) in all the towns of the State, making various inquiries in regard to the sanitary condition of, and measures taken for the improvement of the same, in their several towns and localities, during the preceding year.

In compliance with section 8 of chapter 794, of the Public Laws, it is now obligatory and quite desirable that reports should again be made by persons holding the same official positions, in regard to the same general subjects of inquiry.

The following questions are therefore presented:

1. What diseases have prevailed to an unusually large extent in your town or district during the past year? If any, please give names; first, that affecting (to the best of your knowledge) the largest number of persons; second, the next largest, and so on. Also the localities where they occurred, and the time of the year.

2. Are there any localities in your town or district which are generally believed to foster any one disease more than another? For instance, consumption, typhoid fever, malarial disease, &c. If any, name the localities and the diseases.

3. Are there any localities which are believed to be productive of general ill-health, without resulting in special or definite forms of disease? If so, name the locality or localities.

4. Has any widely spread or largely fatal disease, contagious or otherwise, occurred among domestic animals in your town or district, during the year 1880? If any, give name or names, locality and time of occurrence.

5. What regulations have been adopted, or work of a public or private nature, contemplated, commenced or completed in 1880, by the consent, or under the direction of the town council of your town, or any legally authorized health officer or board of health in the town, in relation to the promotion and protection of the public health?

An early reply is solicited.

Respectfully,

CHAS. H. FISHER, *Secretary.*

## REPORTS FROM TOWN CLERKS

*In relation to prevalence of disease, and acts for the promotion and protection of the public health.*

## BRISTOL COUNTY.

## BRISTOL.

1. The diseases that have prevailed to an unusually large extent in this town during the past year are dysentery during the summer, scarlatina during the whole year. Both diseases were for the most confined to tenement houses in crowded localities.

2. There are several localities of the class that foster disease occupied by poor tenants, where the drainage is exceedingly bad, which proved last summer to be hot beds of dysentery and typhoid.

3. The localities that are productive of general ill-health are so scattered that it would be difficult to describe them; but most of them are in or near the centre of the compact part of the town.

4. No largely fatal disease, contagious or otherwise, has occurred among domestic animals in this town during the year.

5. In regard to regulations adopted, or work of a public nature contemplated in 1880 in relation to the promotion and protection of the public health, it may be said that orders have been passed by the town council for the cleansing of several localities in the town and health officers appointed annually.

PETER GLADDING.

## WARREN.

1. I do not know that any disease prevailed to an unusually large extent in this town during the past year.

2. I do not know of any localities in this town which are generally believed to foster consumption, typhoid fever, or malarial disease.

3. No localities which I know to be productive of general ill-health.

4. No largely fatal disease has occurred among domestic animals in this town during the year 1880.

5. No special regulations have been adopted, or work of a public nature commenced in 1880, under the direction of the town council or any health officer, in relation to the promotion and protection of the public health.

H. H. LUTHER.

## BARRINGTON.

1. The disease that has prevailed to an unusually large extent in this town during the past year is fever and ague, which has never been prevalent here before. It occurred during August, September and October, and principally on the premises of the Brick Co.

2. No localities in town which are generally believed to foster any one disease more than another, unless the brick yards should prove to be such.

3. No localities are known which are believed to be productive of general ill-health.

4. No serious disease, contagious or otherwise, has occurred among domestic animals in this town during the year to my knowledge.

5. No regulations have been adopted by the town council in relation to the promotion and protection of the public health.

M. H. WOOD.

## KENT COUNTY.

## COVENTRY.

1. No diseases have prevailed to an unusually large extent in this town during the past year to my knowledge.

2. I do not know of any localities in this town which are generally believed to foster any one disease more than another.

3. No localities which are believed to be productive of general ill-health.

4. No largely fatal disease has occurred among domestic animals that I have heard of.

5. No regulations have been adopted by the town council, or any health officer in the town, in relation to the promotion and protection of the public health.

S. W. GRIFFIN.

## EAST GREENWICH.

1. No disease has prevailed to an unusual extent to my knowledge during the year.

2. I do not think there are any localities in this town which are generally believed to foster any one disease more than another.

3. There are no localities that I have knowledge of which are believed to be productive of general ill health.

4. There has been no largely fatal disease, nor any contagious disease, that has occurred among domestic animals in this town during the year 1880, unless the epizootic be mentioned.

5. No regulations have been adopted, or work of a public nature commenced in 1880, by or under the direction of the town council, in relation to the promotion and protection of the public health.

EDWARD STANHOPE.

WEST GREENWICH.

1. I think that the disease affecting the largest number of persons in this town for the past year has been scarlet fever, principally in the central and eastern parts of the town, in the autumn and early part of winter. As to the second most prevalent disease I do not know.

2. There are no localities in this town which are generally believed to foster any one disease more than another.

3. I know of no localities which are believed to be productive of general ill-health.

4. No widely spread or largely fatal disease, contagious or otherwise, has occurred among domestic animals in this town during the year to my knowledge.

5. No regulations have been adopted, or work of a public nature commenced, by or under the direction of the town council, in relation to the promotion and protection of the public health.

WM. N. SWEET.

WARWICK.

1. No diseases have prevailed to an unusually large extent in this town to my knowledge during the past year.

2. I have no knowledge of any localities in the town which are generally believed to foster any one disease more than another.

3. I do not think there are any localities which are believed to be productive of general ill-health.

4. I do not know of any widely spread or largely fatal disease, contagious or otherwise, that has occurred among domestic animals in this town during the year 1880.

5. No regulations have been adopted, or work of a public nature commenced, under the direction of the town council of this town, in relation to the promotion and protection of the public health.

B. A. ANDREWS.

NEWPORT COUNTY.

JAMESTOWN.

1. No diseases have prevailed to an unusually large extent in this town during the past year.

2. There are no localities in the town which are generally believed to foster any one disease more than another.

3. And no localities are believed to be productive of general ill health.

4. No widely spread or largely fatal disease, contagious or otherwise, has occurred among domestic animals in the town during the year.

5. No regulations have been adopted, or work of a public nature commenced, under the direction of the town council, in relation to the promotion and protection of the public health.

JOHN E. WATSON,  
per W. J. W.

#### LITTLE COMPTON.

1. No one disease has prevailed in this town to any extent. All have been diseases incident to a country town, and all of a mild nature.

2. There are no localities in the town which are generally believed to foster any one disease more than another.

3. Neither are there any localities which are believed to be productive of general ill-health.

4. No widely spread or largely fatal disease, contagious or otherwise, has occurred among domestic animals in this town during the year. A few cases only of cerebro spinal meningitis.

5. No regulations have been adopted, or work of a public nature of any consequence, commenced by or under the direction of the town council of our town, or any health officer, in relation to the promotion and protection of the public health.

I. B. COWEN.

#### MIDDLETOWN.

1. No disease has prevailed to a large extent in the town of Middletown during the past year, 1880. In November and December, in the Paradise Valley, so-called, near Sachuest Beach, there were a few cases of scarlet fever, but this zymotic disease assumed no virulent character, and most of those attacked with this disease recovered after a brief course of medical treatment.

2. No particular localities, to my knowledge, peculiarly favor the origin of disease. There are few low, marshy districts which engender and diffuse malaria to any great extent.

3. There are no localities which are believed to be productive of general ill-health, so far as I am informed.

4. No largely fatal disease, contagious or otherwise, occurred among domestic animals in this town during the year. Horses, in general, were affected to some

extent by the epizootic disease which raged in October last. This disease was not so severe as when it visited Middletown a few years anterior to 1880.

5. The town council was quite assiduous in endeavors to suppress illegal swine keeping by persons bringing refuse matter from the adjoining city of Newport, and these comprised about all the public measures taken in Middletown, in 1880, for the protection and promotion of the health of its denizens. No provision has been made for vaccination in this town for a number of years.

A. L. CHASE.

#### PORTSMOUTH.

1. No diseases have prevailed to an unusually large extent in this town during the past year.

2. No localities are generally believed to foster any one disease more than another.

3. Neither are there any localities which are believed to be productive of general ill-health.

4. No widely spread or largely fatal disease, contagious or otherwise, has occurred among domestic animals in this town during the year 1880.

5. There have been no regulations adopted, or work of a public nature ordered in 1880, by or under the direction of the town council, in relation to the promotion and protection of the public health

P. B. CHASE.

#### NEWPORT.

1. I do not consider myself competent to answer the first question. Being busy all the time, my opportunity for observation is very limited, and I do not know what diseases are prevailing.

2. There are no localities in this city, to my knowledge, which are generally believed to foster any one disease more than another.

3. I have no knowledge of any localities which are believed to be productive of general ill-health.

4. Am not aware of any widely spread or largely fatal disease, contagious or otherwise, that occurred in domestic animals in this city during the year 1880, and am not in any position to know.

5. In April, 1880, an attempt was inaugurated to remove house offal and swill by a regulated license system, under ordinance passed in 1879, of which you had copies, contracts were made for all the wards. In the 2d and 5th wards great trouble was had from the large hog-pens of the licensed parties which, although placed at the required distance from the line of the compact part of the city, became most horrible nuisances; and much complaint arose from the inefficient

service (especially in the 5th ward, the location of the wealthier residents, the servants being accustomed to sell the house offal in many cases,) in removing the offal. The licenses all expired December 31, and no steps have been taken yet for the coming warm weather. No other sanitary measures have been adopted during 1880, that I remember.

WM. G. STEVENS.

The following ordinances and papers in relation to the promotion of the public health are presented as additional replies to question No. 5:

### THE CITY OF NEWPORT.

#### AN ORDINANCE RELATIVE TO CEMETERY VAULTS AND ENTOMBMENT OF BODIES.

[Passed January 6, 1880.]

*It is ordained by the City Council of the City of Newport, as follows:*

SECTION 1. Every vault or tomb, built wholly or partially above the surface of the ground and used or designed for the reception of dead bodies in any cemetery or other place in said city, shall be examined and shall be opened by the proprietor thereof, or by the person or persons in charge thereof, for examination by the Mayor or the Inspector of Nuisances or any member of the Board of Aldermen, of said city, or any person designated by said Board, whenever and as often as either of the above-named city officers, or any person designated by said Board as aforesaid shall desire or request the same, and shall be thoroughly cleansed and purified by such proprietor, or person or persons in charge thereof, under the direction of said Inspector of Nuisances, or of a person designated by said Board as aforesaid, as often as such Inspector, or such last-named person, shall require the same to be done, not exceeding four times in any one year.

SEC. 2. No dead body shall be deposited or received in any such vault or tomb, unless such body be first hermetically sealed in a metallic coffin, or is intended to be sealed up in the masonry of such vault or tomb, or is placed in such vault or tomb only temporarily, and in a strong, tight box ready for removal; and no dead body shall, without the written license of said Mayor or Board of Aldermen first obtained be left or suffered to remain or be in such tomb or vault for more than ten days, unless the same be carefully sealed in masonry impervious to fluid and to odors.

SEC. 3. No dead body of any human being shall be buried or entombed in this city, nor removed from this city, without a permit first obtained from the Mayor; and every person in charge of a cemetery or burying place, in this city, shall require and receive such permit from the person who procured the same, before allowing the interment or entombment of any such body in such cemetery or burying place, and shall, every Monday before 12 o'clock noon, return to the City Clerk's Office, for the Mayor, every permit so received by him during the week ending with the previous Saturday.

SEC. 4. Every violation of any provision of this ordinance shall be punished



by a fine of not more than twenty dollars, or by imprisonment for not more than ten days; and this ordinance shall go into effect immediately.

AN ORDINANCE IN AMENDMENT OF CHAPTER XX OF "AN ORDINANCE COMPRISING THE ORDINANCES OF THE CITY OF NEWPORT."

[Passed February 16, 1880.]

*It is ordained by the City Council of the City of Newport, as follows:*

SECTION 1. Section 10 of said Chapter XX is hereby amended so as to read as follows: "Section 10. No person shall bury or deposit any dead horse or other animal, or any offal, garbage or rubbish, in or upon Easton's beach, so called."

SEC. 2. Every person who shall violate any provision of said section 10 as hereby amended, shall be fined ten dollars, or be imprisoned not more than ten days for each violation thereof.

SEC. 3. This ordinance shall take effect immediately.

*City Document No. 8.*

MAYOR'S OFFICE, NEWPORT, May 12, 1880.

*Gentlemen of the City Council:*

At the commencement of this year, I called to your attention the subject of an independent Board of Health. Owing to legal objections the subject has not been urged. The Legislature has now by special enactment authorized the City Council to elect such a Board, and to confer upon them such powers as in their judgment they may think best.

During the year, as you are aware, the Board of Aldermen have been favored with the advice of three most competent persons. In asking these gentlemen to serve as an advisory Board of Health, it was "until such time as suitable legislation could be procured."

This arrangement has been of benefit to the city, but it is not such a one as is productive of the best results.

I wish earnestly now to recommend the election of an independent Board in accordance with the act of the Legislature; men selected for their special qualifications for such office, to whose judgment you would individually defer upon any question affecting the sanitary welfare of our city. It is in no sense derogatory to the ability of the gentlemen composing the Board of Aldermen to say that they are not best qualified for the duties of a Board of Health. They themselves would individually admit this to be the case.

Sanitary matters have for Newport a two-fold bearing, *both* of vital importance. As a principle, there can be no question in your mind that we should do all we can to surround every citizen with all proper safeguards to his health and to that of his family. That the neglect of the ordinary laws of health in communities does aggravate disease is, I believe, very generally admitted. That filth is a

proper soil to propagate the germ of certain diseases is perhaps equally true; so that it is safe to assert, that while no precaution could keep away disease, proper precaution might very much modify its virulence. There are, *I believe*, localities in this city where the sanitary condition is so bad as to render it almost certain that there will be at least one death a year from preventable causes. This does not perhaps strike one very forcibly, unless we stop and think, some one dear to us may die where otherwise they might have lived. Looked at from this standpoint, it seems a very serious matter. With every indication of the prevalence of scarlet fever as an epidemic in our midst, next winter—the seeds having been sown this year in six or eight localities; with the small pox in various cities around; with the *reports* of yellow fever thus early in the year at New Orleans, and even and as far north as Delaware Breakwater; it does seem as though it was the duty of the city to adopt a more thorough and intelligent method regarding its sanitary condition.

As a policy, Newport stands in a position where to neglect due attention to sanitary reform, is a question of a loss each year of a definite sum in dollars and cents. Let but half a dozen families be deterred from coming here for a single season, by reason of some report of sanitary neglect, and Newport has lost a sum equal to the expense of a Board of Health for a number of years.

I would recommend that the City Council, at the beginning of the year, should elect three gentlemen, to serve without pay, for terms of one, two and three years, respectively. The offices of Inspector of Nuisances and Overseer of small pox should be abolished, and they should have the authority to appoint a sanitary inspector, who might also be secretary of the Board.

Any increased expenditure, by reason of this change, would be capital so invested as to return to the city each year ample and satisfactory dividends.

J. TRUMAN BURDICK,  
*Mayor.*

#### INAUGURAL ADDRESS.

In his Inaugural Address, June 7, 1880, His Honor Stephen P. Slocum, Mayor, made the following remarks in relation to the public health:

“The preservation of the public health is a matter which goes directly to the existence of the community, and therefore should receive your careful consideration, and will demand your determined and energetic action. The refuse from every dwelling in the city should be promptly removed, and be so removed that the public health and the public convenience will not suffer either by its presence or its removal. The subject of improved drainage for the city has already occupied much of the attention of the City Government, and will command, as it deserves, much attention from you; but the subject calls for something more than consideration. It needs that a plan should be adopted and that action should be had under it. Not only that a plan should be adopted, but that something should be done toward carrying out the plan adopted.”

*City Document No. 28.*

## ANNUAL REPORT OF THE INSPECTOR OF NUISANCES.

*To the Honorable City Council:*

GENTLEMEN—The undersigned herewith submits his Annual Report on Nuisances for the year ending May 31, 1880. Whole number complained of during the year is six hundred and ninety-seven, all of which have been abated.

First quarter, ending August 31, 1879.....	329
Second quarter, ending November 30, 1879.....	227
Third quarter, ending February 27, 1880.....	33
Fourth quarter, ending May 31, 1880.....	108
	—697

I would state that the vaults in the different burying-grounds have been examined. There have been forty-seven remains removed from the Island Cemetery vaults, and six remain in No. 41; five are bricked in, and one prepared to be removed. Said vaults have been cleaned, cleansed and whitewashed; all the rest of the vaults are in very good condition. I have also notified one hundred and fifty-two persons that have kept hogs within the limits of the compact part of the city that they must remove them outside of the compact part of the city, and they have done so. I know not of any hogs within said limits at this time.

Respectfully submitted,

WM. H. BAILEY,  
*Inspector of Nuisances.*

The following note from Capt. J. P. Cotton, of the Engineer Office U. S. A., will explain itself:

NEWPORT, R. I., May 12, 1881.

*Charles H. Fisher, M. D., Secretary State Board of Health, Providence, R. I.:*

DEAR SIR—I have been trying to find time to answer your questions, but up to this time have failed. I will now endeavor to do so.

1. *Plan of sewerage?* The answer to this is given in the report sent to-day.
2. *Plan of water supply?* The collecting ground is, for the most part, an agricultural one, with gentle slopes. The impounding reservoir is a portion of Easton's pond. The bottom of it, in the shoaler portions, is silt with a rank vegetable growth. This growth causes a discoloration and a slight taint to the water in the latter part of the summer. There is a small reservoir, holding a few days' supply, to be drawn from in case of accident to the pumping machinery.
3. *Quality of water?* There have been frequent analyses of the water, and in nearly every case the report of these has been that it was of excellent quality. One made late last season was unfavorable in the amount of organic matter, I am told.

4. *Number of users?* There are between 800 and 900 takers of water, or probably about one-third of the inhabitants.

5. *Condition of wells?* I should regard all wells in the old part of the town as suspicious.

6. *Proportion of population using wells for drinking water?* About one-third of the inhabitants (I think) use wells.

7. *Proportion using cisterns?* About one-third use cistern water.

8. *What business, malodorous or unsanitary?* Two bone-boiling and soap works are perhaps the only ones strictly so. These are small, but a nuisance in their neighborhoods. Efforts have been made to get rid of them, but thus far unsuccessfully.

Yours truly,

J. P. COTTON.

## PROVIDENCE COUNTY.

### BURRILLVILLE.

1. The diseases that have prevailed to an unusually large extent in this town during the past year are diphtheria, tonsillitis and laryngitis.

2. There are very few, if any, localities in this town which are generally believed to foster any one disease more than another. It may be said, however, that typhoid fever is generally more prevalent in the village of Plainville than elsewhere in the town.

3. No localities are known which are believed to be productive of general ill-health without resulting in special forms of disease.

4. No widely spread or largely fatal disease, contagious or otherwise, has occurred among domestic animals in the town during the year.

5. No regulations have been adopted in 1880 by the town council of this town in relation to the promotion and protection of the public health, except that a large piggery has been removed from the town by order of the town council.

ALVAH MOWRY.

### CUMBERLAND.

1. No diseases have prevailed to an unusually large extent in this town during the past year to my knowledge.

2. I have no knowledge of any localities in this town which are generally believed to foster any one disease more than another.

3. Nor do I know of any localities which are believed to be productive of general ill-health.

4. There was not any widely spread or largely fatal disease, contagious or

otherwise, which occurred among domestic animals in this town during the year 1880, except a disease of cattle during the fall of 1880, confined to the farm of Joel P. Jenckes, the name of which I am not able to give.

5. No regulations have been adopted of a public nature during 1880 by the town council of this town in relation to the promotion and protection of the public health.

H. A. FOLLETT.

FOSTER.

1. No diseases have prevailed to an unusually large extent in this town during the past year. Scarlet fever—only two deaths—locality, the central part of the town. A considerable number of cases of pneumonia and typhoid fever have occurred during the year.

2. There are no localities in town which are generally believed to foster any one disease more than another to my knowledge.

3. I have no knowledge of any localities which are believed to be productive of general ill-health.

4. I have not heard of any widely spread or largely fatal disease, contagious or otherwise, that has occurred among domestic animals in this town during the year 1880.

5. There have been no regulations adopted, or work commenced or completed in 1880, by or under the direction of the town council of this town in relation to the promotion and protection of the public health.

G. W. PHILLIPS.

GLOUCESTER.

1. No diseases have prevailed to an unusually large extent in this town during the past year.

2. No places are known to me in this town which are generally believed to foster any one disease more than another.

3. Nor do I know of any localities which are believed to be productive of general ill-health.

4. No widely spread or largely fatal disease, contagious or otherwise, has occurred among domestic animals in the town during the year.

5. No regulations have been adopted, or work of a public nature commenced or completed in 1880 under the direction of the town council, in relation to the promotion and protection of the public health.

C. W. FARNUM.

## NORTH PROVIDENCE.

1. No diseases have prevailed to an unusually large extent in this town during the past year. The town has been more healthy than usual during the whole year.

2. Not any localities in the town which are generally believed to foster any one disease more than another.

3. And there are no localities which are believed to be productive of general ill-health.

4. No widely spread or largely fatal disease, contagious or otherwise, occurred among domestic animals in the town during the year.

5. No regulations have been adopted, or work of a public nature commenced or completed in 1880, under the direction of the town council of this town or any health officer, in relation to the promotion and protection of the public health.

T. H. ANGELL.

## LINCOLN.

1. No diseases have prevailed to an unusually large extent in this town during the past year.

2. There are no localities in this town to my knowledge which are generally believed to foster any one disease more than another.

3. No localities which are believed to be productive of general ill-health.

4. No widely spread or largely fatal disease, contagious or otherwise, has occurred among domestic animals in this town during the year 1880.

5. No regulations have been adopted, or work of a public nature contemplated, commenced or completed in 1880, by or under the direction of the town council of this town or any legally authorized health officer, in relation to the promotion and protection of the public health.

W. H. GOODING.

## PAWTUCKET.

1. I am not certain that any diseases have prevailed to an unusually large extent in this town during the past year. The following were deaths from some prominent diseases: Cholera infantum, 24; pneumonia, 22; consumption, 18; scarlet fever, 14; typhoid fever, 12; scarlatina, 9; total, 99. There were returned to this office for the year ending 1880, 204 deaths; from other causes not specially mentioned there were 105 deaths.

2. There are no localities to my knowledge in the town which are generally believed to foster any one disease more than another.

3. I know of no localities which are believed to be productive of general ill health.

4. No widely spread or largely fatal disease, contagious or otherwise, has occurred among domestic animals in this town during the year.

5. No regulations have been adopted, or work of a public nature of importance commenced in 1880, by or under the direction of the town council or any legally authorized health officer, in relation to the promotion and protection of the public health. A thorough system of water supply has been completed within two years, and is now in successful operation.

LEWIS PEARCE.

#### SCITUATE.

1. No diseases to my knowledge have prevailed to an unusually large extent in this town during the past year.

2. I do not know of any localities in the town or district which are generally believed to foster any one disease more than another.

3. I have not heard of any localities which are believed to be productive of general ill-health.

4. No widely spread or largely fatal disease, contagious or otherwise, has occurred among domestic animals in the town during the year 1880. The epizootic among horses prevailed to some extent in October and November.

5. No regulations have been adopted, or work of a public nature commenced in 1880, by or under the direction of the town council of this town, in relation to the promotion and protection of the public health.

D. H. REMINGTON.

#### SMITHFIELD.

1. If any diseases have prevailed to an unusually large extent in this town during the past year they are to the best of my knowledge the following: Scarlatina, March and May; diphtheria, May.

2. I do not know of any localities in the town which are generally believed to foster any one disease more than another.

3. I think there are no localities which are believed to be productive of general ill-health.

4. No widely spread or largely fatal disease, contagious or otherwise, has occurred among domestic animals in this town during the year.

5. No regulations have been adopted, or work of a public nature commenced in 1880, by or under the direction of the town council of this town, in relation to the promotion and protection of the public health.

O. A. TOBEY.

## WOONSOCKET.

1. I do not learn that any serious diseases have prevailed to an unusually large extent in this town during the past year.

2. I have no knowledge of any localities in this town which are generally believed to foster any one disease more than another.

3. I know of no localities which are believed to be productive of general ill-health.

4. No widely spread or largely fatal disease, contagious or otherwise, has occurred among domestic animals in this town during the year 1880, unless the epizootic among horses be excepted.

5. No regulations have been adopted, or work of a public nature commenced in 1880, by or under the direction of the town council or any legally authorized health officer, in relation to the promotion and protection of the public health to my knowledge.

A. E. GREENE.

## PROVIDENCE.

1. The diseases that have prevailed to an unusually large extent in this city during the past year are as follows, named in the order of largest number, as nearly as known: catarrhal influenza, bronchitis, scarlatina, pneumonia, cholera infantum and typhoid fever.

2. There are no localities in the city which are generally believed to foster to any large extent any one disease more than another. There are several locations, of limited extent, where reckless and abandoned characters congregate, and live in filthy and poorly ventilated rooms, and filthy surroundings, in which typhoid fever, cholera infantum and consumption are fostered.

3. The localities which are believed to be productive of general ill-health are those mentioned under question 2.

4. No largely fatal disease, contagious or otherwise, has occurred among domestic animals in the city during the year 1880. The epizootic among horses in October and November, was the most widely spread. Spinal meningitis has affected a considerable number of horses, and has necessitated the killing of many.

5. The regulations that have been adopted, and works of a public nature contemplated, commenced or completed in 1880, by the consent or under the direction of the city council, in relation to the promotion and protection of the public health, are as follows:

In July, an ordinance was passed (which became a city law in September) to carry into effect chapter 815 of the Public Laws in relation to a board of public works for the city. Section 2 of said chapter 815 reads as follows:

"The board of public works shall have, subject to the control of the city coun-



cil, the general charge and management of the construction, reparation and maintenance of all common sewers and drains, whether laid in public streets or through private property."

In his Inaugural at the commencement of the year, the Mayor observed, "That the board of aldermen at the present time, in consequence of the amount of other business, cannot give that attention to matters concerning the public health which should be accorded thereto, and hence the sanitary measures are entirely left to the superintendent, and the board has to pass hastily upon such subjects as he may present for consideration.

"It is the opinion of the superintendent of health, that a board of health should be organized in this city, the members of which should be selected with special reference to their qualifications for the position, and who shall have the time to devote to the proper performance of their official duties. In this opinion I fully concur, and therefore bring the matter to your notice.

"An act passed by the general assembly April 12, 1878, provides for the appointment by the city council of a board of health, 'which shall have all the powers and duties now conferred by law upon the board of aldermen as a board of health.' Such a board, therefore, can be established at the pleasure of the city council, without the slightest interference with the workings of the department, and with but slight expense, as the members would serve without compensation. With practical men giving their direct attention to sanitary measures, the best of results must follow therefrom, and the city be made still more desirable as a place of residence.

"There are many subjects of vast importance to the sanitary as well as to other interests of the city, which would claim their calm, deliberate and careful judgment, and to which their attention could be at once devoted. Among these is one to which the board of aldermen cannot give due heed, and that is the quantity of sewage being poured into the waters above, beneath and just below Weybosset bridge, which, added to the refuse poured into the two rivers emptying into the cove basin, is accumulating a mass of filth deleterious to public health and dangerous in the extreme. This matter cannot be too quickly considered, unless it be thought best to await the coming of disease before a remedy be provided. In this case prevention will certainly be better than cure."

## BOARD OF PUBLIC WORKS.

### RULES AND REGULATIONS FOR LAYING PRIVATE DRAINS.

1. Applications for permits to connect with any sewer must be made in writing to the board of public works by the owners of the property to be drained, or by their duly authorized attorneys, and must be accompanied by a clear description of the premises to be drained, and of the drains required, and also by certain agreements, all as provided in the printed form of application issued by said board.

2. No one but a drain-layer duly licensed by the board of public works will be allowed to make connections with the public sewers named in the above section, nor lay any drains in connection therewith, and any person so licensed shall

give personal attention to any work done under his license. He shall also employ none but competent persons to do said work.

3. Notice must be given at the office of said board, and if necessary, twenty-four hours before any street or public way can be opened for the purpose of laying a private drain, or before any drain pipe can be extended from work previously done and accepted, or new connections of any kind be made with such work, unless otherwise permitted by the city engineer.

4. No work of laying drains can be commenced or continued unless the permit is on the ground, in the hands of the drain-layer, or some one employed by him.

#### RULES FOR LAYING DRAINS.

1. In opening any street or public way, all materials for paving or ballasting must be removed with the least possible injury or loss of the same, and together with the excavated materials from the trenches, must be placed where they will cause the least practicable inconvenience to the public. As little as possible of the trench must be dug until the junction piece into the sewer is found, unless it is first determined to make a new opening into the sewer.

2. Whenever, in the opinion of the city engineer, or authorized inspector, the sides of the trenches will not stand perpendicular, sheeting and bracing must be used to prevent caving.

3. The board of public works, the city engineer, and their authorized agent, are to have at all times facilities for inspecting the work and materials while under the charge of the drain-layer; and, if so required, no pipes or other materials for the drains can be used till they have been examined and approved.

4. The least inclination that can be allowed for water closet, kitchen and all other drains of not over six inches diameter, liable to receive solid substances, is one-half an inch in two feet; and for cellar or other drains, to receive water only, one quarter of an inch in two feet. The depth of the crown of the drain at the curb line shall be determined by a rise of a quarter of an inch per foot from the crown of the sewer directly opposite.

5. The ends of all pipes, not to be immediately connected with, are to be securely stopped by brick and cement, or other water-tight and imperishable materials.

6. All pipes that must be left open to drain cellars, areas, yards or gardens, must be connected with suitable catch-basins, the bottoms of which must not be less than two and one-half feet below the bottom of the outlet pipe, the size, form and construction of which are to be prescribed by the officers named in the second rule. When meat-packing houses, slaughter houses, lard rendering establishments, hotels or eating-houses, are connected with the sewers, the dimensions of the catch-basins will be required to be of a large size, according to the circumstances of the case. When the end of the drain pipe is connected with a temporary wooden catch-basin for draining foundations during the erection of buildings, the drain-layer will be held responsible that no dirt or sand is carried into the drain or sewer from such temporary catch basin.

7. No private catch-basin can be built in the public street, but must be placed inside of the line of the lot to be drained, except when the sidewalks are excavated and used as cellars.

8. Unless special permit shall be granted by the board of public works, no privy vaults can be connected with the sewers except through an intervening catch-basin, and the discharge pipe of the vault must be high enough above its bottom to effectually prevent anything but the liquid contents of the vault from passing into the drain.

9. The inside of every drain, after it is laid, must be left smooth and perfectly clean throughout its entire length, and to insure the same, a scraper of suitable material, of the shape of the pipe, and slightly less in diameter, shall be drawn through each length of pipe after the same has been laid.

10. In case it shall be necessary to connect a drain pipe with a public sewer where no junction is left in such sewer, the new connection with such sewer can only be made either by one of the employees of the board of public works, or when an officer, named in rule two, is present to see the work done.

11. Whenever it is necessary to disturb a drain in actual use, it must in no case be obstructed without the special direction of one of the officers named in rule two.

12. The back-filling over drains, after they are laid, must be puddled or solidly rammed, and together with the replacing of ballast and paving, must be done within forty-eight hours after the completion of that part of the drain lying within the public way, and done so as to make them at least as good as they were before they were disturbed, and to the satisfaction of the board of public works and the officers mentioned in second rule; and the owner will be held responsible for any settlement of the ground which occurs within one year on account of laying said drain. All water and gas pipes must be protected from injury or settling, to the satisfaction of the engineer.

13. Every drain-layer must enclose any opening which he may make in the public streets or ways with sufficient barriers, and must maintain red lights at the same at night, and must take all other necessary precautions to guard the public effectually against all accidents from the beginning to the end of the work; and can only lay drains on condition that he shall use every precaution against accidents to persons, horses, vehicles, or property of any kind.

14. In case a water or gas pipe should come in the way of a drain, the question of passing over or under the water or gas pipe, or of raising or lowering it, must be determined by one of the officers named in rule two.

15. All exhausts from steam engines, and all blow-offs from steam boilers, must be first connected with a catch-basin of such dimensions as the officers mentioned in second rule may prescribe, and in no case will they be allowed to connect directly with the private or public sewers, without special permission from the board of public works or the city engineer.

16. Such information as the city engineer has with regard to the position of

junctions will be furnished to drain-layers, but at their risk as to the accuracy of the same.

17. When any change of direction is made in the pipe, either in a horizontal or vertical direction, curves must be used. No pipe can be clipped contrary to the direction of officers mentioned in rule two.

18. All persons are required to place an effectual trap in the line of drain just before it leaves the premises, and to make an open connection with a down-spout back of the trap; also, when possible, to make an open connection with the highest part of the soil-pipe within the premises through a large pipe or flue, to a point above the roof of the building, unless special permit to vary from the same shall be granted by the board of public works.

19. The drain-layer shall faithfully observe all the rules for laying drains, as adopted by the board of public works, and, if so directed, shall not cover any of his work until it has been examined and accepted by the proper officer.

20. No drain-layer or person employed by him will be allowed to rest any planking or other material upon any gas or water pipe. Violations of this rule will be sufficient cause for the revocation of license.

21. The drain-layer who obtains the permit shall faithfully fill out the blank return provided, whether for new work or for alterations or additions, and return the same within forty-eight hours after the completion of said work.

22. All work shall be done in such manner and at such times as to interfere as little as possible with the public travel and convenience; and the drain-layer shall conduct his work for this object as the engineer may from time to time direct.

23. Every person violating any of the provisions of the foregoing rules shall be liable to pay a fine of not less than twenty nor more than fifty dollars, and shall be subject to a forfeiture of his license.

The following Regulations, providing for obtaining Reports of Cases of Contagious, Infectious, or Epidemic Sickness, were continued in force:

1. Every physician having knowledge of the existence of any case of contagious, infectious, or epidemic disease within the city of Providence, shall immediately make a report thereof in writing, to the superintendent of health of said city, with such particulars as the said superintendent may indicate on blanks furnished for that purpose.

2. The diseases referred to in the preceding section shall, among others, include especially small pox, diphtheria, typhoid fever, typhus fever, scarlet fever or scarlatina, cerebro-spinal meningitis or spotted fever, measles, and whooping cough.

3. Any physician who shall fail to comply with the preceding regulations, shall be fined not less than two dollars nor more than ten dollars for each day of such neglect, after having knowledge thereof as aforesaid.

## WASHINGTON COUNTY.

## CHARLESTOWN.

1. No diseases have prevailed to an unusually large extent in this town during the past year.
2. There are no localities in this town which are generally believed to foster any one disease more than another.
3. And no localities which are believed to be productive of general ill-health.
4. There has been no widely spread or largely fatal disease, contagious or otherwise, among domestic animals in the town during the year 1880.
5. No regulations have been adopted, or work of a public nature commenced in 1880, or under the direction of the town council, in relation to the promotion and protection of the public health.

CHARLES CROSS,  
per A. H. ECCLESTONE, M. D.

## EXETER.

1. The diseases that have prevailed to an unusually large extent in this town during the past year are typhoid fever—largest number of cases of—about all recovered; and cholera infantum next—most cases fatal.
2. I am not aware that there are any particular localities that foster any disease.
3. I am not aware of any localities which are believed to be productive of general ill-health.
4. No widely spread or largely fatal disease, contagious or otherwise, among domestic animals during the year 1880.
5. No regulations have been adopted, or work of a public nature commenced in 1880, by or under the direction of the town council, in relation to the promotion and protection of the public health.

N. B. LEWIS.

## HOPKINTON.

1. No diseases have prevailed to an unusually large extent in this town during the past year.
2. There are no localities in the town which are generally believed to foster any one disease more than another.
3. I do not think there are any localities which are believed to be productive of general ill-health.

4. No widely spread or largely fatal disease, contagious or otherwise, has occurred among domestic animals in this town during the year 1880.

5. No regulations have been adopted, or work of a public nature commenced in 1880, by the town council of this town, in relation to the promotion and protection of the public health.

E. R. ALLEN.

RICHMOND.

1. No diseases, to my knowledge, have prevailed to an unusually large extent in this town during the past year.

2. No localities in the town which are generally believed to foster any one disease more than another.

3. I am not aware of any localities which are believed to be productive of general ill-health.

4. There has been no widely spread or largely fatal disease, contagious or otherwise, among domestic animals in this town during the year.

5. No regulations have been adopted, or work of a public nature commenced in 1880, by the town council of this town, in relation to the promotion and protection of the public health.

H. P. CLARKE.

SOUTH KINGSTOWN.

1. No diseases have prevailed to an unusually large extent in this town during the past year except an epidemic bronchitis.

2. There are no localities in this town, to my knowledge, which are generally believed to foster any one disease more than another.

3. No localities which are believed to be productive of general ill-health.

4. No widely spread or largely fatal disease, contagious or otherwise, among domestic animals in this town during the year.

5. No regulations have been adopted, or work of a public nature commenced in 1880, by the town council of this town, in relation to the promotion and protection of the public health, except in June, 1880, the town council ordered vaccination, which was performed at district school-houses by Drs. J. E. Perry, of Wakefield, and H. L. Stillman, of Usquepaug.

## LOCAL BOARDS OF HEALTH.

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It has been previously stated that the town councils of the towns, and the aldermen of the cities, are by law the local boards of health in their several towns or cities, unless the town councils or city councils appoint special boards of health to supervise that department of duty in place of the said town councils or board of aldermen.

In the State of Rhode Island, no town or city council has appointed any such board of health for a permanent work, or delegated its powers in the direction of conserving the public health to any individual, board or committee. In compact communities, where exists a population of ten thousand or more, a health officer or board of three or more persons, having special qualifications for making sanitary investigations, should be appointed to detect and report the existence of places and conditions prejudicial to the health of the people in the vicinity of those places, and suggest means of abatement.

In the absence of such special appointments, the people of any compact community may accomplish much by the formation of voluntary associations, for the mutual advantage of the members themselves, and eventually of those in the midst of whom they reside.

But few such organizations have been formed in this State, and among them by far the most important is that, an account of which follows, given in considerable detail, as the reasons for the organization and objects to be attained exist in other communities, and the views entertained by its members are eminently pertinent and true, and may be profitably entertained elsewhere.

### SANITARY PROTECTION ASSOCIATION OF NEWPORT.

This organization was established near the close of the year 1878.

It comprises, among its members, gentlemen of the highest intelligence, largest culture, and most prominent social position in Newport, men distinguished in literary, scientific and business pursuits, private

citizens and citizens connected with public service in the city, the State, and the United States.

It is not much too to say, that its existence has been and bids fair to be of value to the city, as a constant monitor of sanitary neglect, and a constant agitator of questions appertaining to public and individual health, healthy homes and healthy surroundings. It would be well if such an organization existed in every town in the State. The let-alone policy is the policy of retrogression and decay. Agitation is life, apathy is death.

If, as is alleged by some parties, this association is too aggressive, and seemingly unwarranted in its attacks upon the sanitary and legal status of the city, it should be remembered in extenuation of its proceedings, that reform is seldom accomplished otherwise than by vigorous and repeated attacks upon existing evils; and, admitting that evils exist, it is often necessary to propose more stringent and extensive measures, and point to more brilliant results than can be expected to be obtained in order to *secure* measures and results that are *absolutely* needful. This is not saying, however, that the association is governed by any such motive.

The following extracts are taken from the Report of the Secretary, made at the annual meeting in 1880. The reasons for the organization of the association, the objects which it desires to accomplish, and an account of some of the work done and results obtained, are in part given.

"The inhabitants of Newport, owing to the situation of their city, have always enjoyed remarkably good health, and the fact that this has been the case is looked upon by them with pride and satisfaction, and they have been unwilling to open their eyes to the present or to look forward to the future. It is sufficient that the pure air of heaven has, in the past, brought health and longevity to them, and it is taken as a matter of course that such will be the case for all time to come.

"To be sure, the breezes, as they blow fresh from the sea, are pure as of old, but as they come sweeping through the now thickly populated town, passing through back-yards filled with mire of slops and filth, and over stagnant water and marsh, the receptacles of garbage and sewage, the pure oxygen is soon contaminated with gases which are not health-giving though they may not immediately kill.

"There was a time when wells dug down into the solid rock furnished pure spring water. By an occasional cleaning of the well, one generation after another could go on using this water without a doubt of its purity. But estates have been divided and sub-divided, other wells have been sunk, and new cess-pits dug—the latter, perhaps, on account of the narrow limits of the place, close to the well of some old homestead.

"Soon the soil becomes impregnated by the liquid filth, and, naturally, the



water of the wells in the neighborhood is infected. This has continued until it is the exception where the water of a well is found fit for domestic purposes.

"In some portions of the city, owing to the neglect of the public authorities to remedy existing evils, the air became laden with poison germs, and so reduced the system of many, that they readily fell victims to any contagious disease which might spring into existence.

"The importance of placing under strict vigilance the inmates of a house where such disease existed, was overlooked, so that the death-rate of Newport, though small as compared with other cities, was large in those cases which might have been prevented.

"Eminent physicians, summer residents of Newport, anxious as well for the reputation of the city, as to adapt the place to the necessities of city patients, alluded in print to the importance of measures being taken to improve its sanitary defects, and complaints were addressed to the city authorities by native physicians and others. But these appeals were unwelcome and unheeded, and far from what was earnestly desired, resulted in openly expressed ingratitude to the authors of them.

"Although the board of aldermen were empowered by the state to appoint a board of health, which should have all the powers and duties conferred upon the board of aldermen, as a board of health, and notwithstanding the wish of the people, and a memorial signed by the physicians of the city, yet they practically refused to exercise their powers, nor would they confer them upon others.

"Thus matters stood in the fall of 1878 when the Sanitary Protection Association was organized for the purpose of mutual insurance, an organization of citizens acting in self defence. But, by its constitution, it has no political interests whatever, but was organized strictly for the preservation of private and public health.

"It is not, as many seem to think, intended as a substitute for municipal inspection, nor will it conflict with the action of the public authorities, but it solely wishes to assist them in their protection of every citizen.

"The new principle of sanitary protection was originally conceived by Prof. Fleeming Jenkin, of the University of Edinburgh, in the early part of 1878, and an association was formed in that city, the objects of which form the basis upon which the Newport association is founded. These are—

"To provide its members, at moderate cost, with such advice and supervision as shall insure the proper sanitary condition of their own dwellings.

"To enable members to procure practical advice, on moderate terms, as to the best means of remedying defects in houses of the poorer class in which they are interested.

"And to aid in improving the sanitary condition, and consequent good repute, of the city, by following such course as, in the opinion of the council, may seem calculated to promote this object.

"The tardiness which the public shows in availing themselves of the benefits of such an association may be attributed to apathy in some, and in others, to ignorance. We are constantly reading of death and disease due to the neglect of the simplest precautions; we are instructed through the columns of the newspapers, and by sanitary tracts and primers, as to what we should do, but, with

the best will in the world, we cannot always be thinking about drains, nor can every householder qualify himself for the functions of house surveyor and medical officer of health; so the practice of the father of a family usually is to let things alone until, under the alarm of illness in his house, he decides that the drains must be looked into. Advice may be given, and work done, by some local tradesman, who may be ignorant or careless of sanitary requirements, and one cannot feel certain that he has got his money's worth in safety.

"Matters are somewhat mended when a sanitary engineer of repute is consulted, but the bill will be much larger. And so, with many, the fear of the expense induces them to subject themselves, and other people, to much risk.

"We all know that the result of long experience proves that poison-germs enter from without, chiefly by the agency of sewer-gas and drinking water. Serious illness may be contracted by breathing air containing an almost infinitesimal quantity of tainted gas. Simple sewer gas is little worse than a bad smell, but the tainted gas may be so poisonous, that a very little introduced into a bedroom, so little as to be quite imperceptible to the nose, will almost certainly give typhoid fever to a person sleeping there. How important then it is that we should not only put our houses in perfect order, but keep them so—and this can only be done by a systematic inspection.

"In some cities an official exists whose duty it is to inspect the execution of all work which pertains to the sanitary arrangement of a house, while it is being built, but his duty does not extend to any subsequent inspection.

"The drains and pipes may have been well designed, and the work well executed, but the decay and failure of drains and pipes is especially dangerous, because these are invariably out of sight. The lead and iron pipes are gradually eaten away, until large holes admit sewer-gas behind the paneling, and so into our bedroom. Yet no greater warning is given than a slight closeness in the room.

"Drains crack underground, as old or new houses settle, and the sewage pours into the basement; some one of the family, with the sense of smell more acute than with others, complains of bad odors, but the evil grows so slowly, that we are not forced into action on any one day.

"Cement crumbles away from joints originally well made; rats eat through putty, and then at the junction, perhaps, of an expensive leaden pipe with a well laid drain, we have a hole, through which, day and night, sewer-gas pours into the house; and yet the house may be considered remarkably sweet.

"Not unfrequently, the passage of the sewage through the drains is wholly interrupted by the mere accumulation of kitchen grease, or rags; then, while the sewer retains the solid filth, the liquid oozes out at every pore, and yet no harm is suspected. Sometimes, even in a hidden pipe, no trap whatever is introduced between the house and the sewer, and no one is at all the wiser until disease breaks out.

"These accidents are samples of ordinary and inevitable decay, even when work has been well designed and well executed, as has been demonstrated time and time again, and in the inspections made by the engineer of this association, every one of the defects enumerated above have been encountered.

"This shows the importance of a systematic inspection. But few people are willing to incur the expense or the professional skill which such an examination

requires, but if each person interested subscribes his annual fee, then he may command the service of a competent engineer, and feel secure in the permanent efficiency of his arrangements.

"The association has been slow in its growth, but, upon considering the disfavor with which it was received by the people of our city in the early portion of its existence, we have cause for congratulation that it is steadily increasing its good work, and gaining ground in the estimation of the public.

"Communications have been received from all parts of the country, requesting information in regard to the workings of the association, and in several cities, societies, springing from our own, have been formed, and are now in successful operation.

"Owing to the advantageous arrangement which this association, as a corporate body, is enabled to make, for the examination of water, many members have obtained an analysis, and, of the well waters examined, only one sample has been good water. Of the city water, two analyses have been made, one showing the water to be good, and the other, made during a season of continued drought, the water of the pond being low, and the sample unfiltered, resulting not so favorably.

"It is the desire of the association to have an analysis of the city water made each month, for the space of one year, that the average condition of the water, which so many of us use, may be ascertained.

"The association, in the exercise of its function of caring for the interests of its members, as also 'to improve the sanitary condition, and subsequent good repute of the city,' has sent several communications to the city authorities, and although as a general thing, these memorials have apparently been treated with indifference, yet they have served as food for thought, and so have not been without avail.

"During the past year, the public authorities have done much for the sanitary improvement of the city, and the present mayor, in his inaugural, impresses upon the city council the importance of determined and energetic action in all that pertains to the public health. Let us hope that the advance already made may be continued, until Newport may justly have the reputation, at home and abroad, of being one of the most healthy cities in the world.

"But do not leave all the work and responsibility to the city authorities. Each one of us is responsible for the sanitary condition of his own premises, and no one has a right to rest in his efforts until he has done all that is possible to secure the continued good health of all within his dwelling."\*

The following questions, taken from the Circular Letter No. 1, of the Association, are applicable to nearly all homes, and especially those having sink or soil pipes leading to cess pools or sewers:

(a) Are the sanitary surroundings of the house perfect? Do the trees and shrubbery permit sufficient exposure of it to the sun?

(b) Is the water pure and drinkable? If from a well or cistern, has it connection with the external air?

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\* Lt. Comm. E. M. Stedman, U. S. N., Sec.

(c) Is the cellar dry, well ventilated and free from decomposing matter which may give forth seeds of sickness and death, and has it a drain? This drain must be wholly unconnected with any sewer.

(d) Is the cellar air entirely excluded from the air supply of the furnace?

(e) Has every bed chamber free ventilation and direct means of communication with the external air?

(f) If contagious or infectious disease of serious character has occurred in the house, have the sick chamber, etc. (bedding, wearing apparel, curtains, carpet and upholstered furniture), been thoroughly disinfected, and the wall paper removed?

(g) Has each water closet means of external ventilation, and not into an entry or bed chamber?

(h) Are the soil pipes in a sound condition and easily accessible for examination? Are they of iron, with lead plugged joints (the only true condition for a properly constructed soil pipe)? or are the pipes of lead? and if of lead have they been in the house for a number of years, and thus perforated with holes through which sewer gas escapes into the house?

(i) Has the soil pipe a proper vent through the roof?

(j) Is the soil pipe in its exit through the foundation of the house of iron or of earthen ware? If of the latter is it broken off in or just outside of the foundation, so as to allow the sewage matter of the house to find its way throughout the foundation (a condition which is almost always found to exist where earthen ware pipes are used)?

(k) If there are set bath tubs, basins or wash tubs, are they securely trapped? Is the kitchen sink safely trapped? It must not be forgotten that the ordinary bell trap does not perfectly exclude sewer gas, which its water absorbs and transmits, and that the S trap is liable to be "syphoned," or emptied by inward suction, so as to permit the escape of gas into the house from the soil pipe or drain.

(l) Is the waste water pipe of the refrigerator entirely cut off from all connection with the soil pipe?

(m) Is the cesspool near the foundation wall? is the cesspool a loose one? and is there any overflow, or leakage into the foundation, cistern or well?

A very lengthy and exhaustive account, historical and descriptive, of the initial steps taken, progress, organization and work of the members, individually and by association from the beginning down to the present time, was prepared by Dr. H. R. Storer, Corresponding Secretary of the association, but its length precluded its publication entire in the limited pages of this report, and, as it was so connected in all its parts as to forbid the use of any part in justice to the whole, its publication was relinquished by force of circumstances.

## INTERMITTENT FEVER.

During the late summer and autumn of the year 1880, reports came from several towns in the State of the prevalence of intermittent fever to a greater or less extent. It was reported as prevalent to a limited extent in East Greenwich as early as June. A few cases, widely scattered, occurred in the inland towns, otherwise the disease prevailed in much the largest measure in towns lying upon the Atlantic ocean and Narragansett bay.

It has been handed down by tradition that the early settlers in this State, as well as those in many parts of Massachusetts and Connecticut, were subjected to the annual visitations of this disease. It clung to sections of western Massachusetts and central and western Connecticut quite largely, perhaps, no longer than thirty years ago. In this State it has scarcely been known within the present century until within a very recent period.

In other States, where it had apparently disappeared or had scarcely a noticeable existence twenty years ago and more, it has reappeared during the last few years, and up to the last season has gradually increased in prevalence and not infrequently in severity.

In this State the cases reported during the last year were not of the severest type, with the exception of those that occurred in Barrington.

## THE INTERMITTENT FEVER IN BARRINGTON.

The suddenness of the outbreak, with the great severity of initial type, the large number attacked within the period of a few days and in a locality never before known to be visited, mark the circumstances of the fever in Barrington as of most extraordinary occurrence.

On the 18th of August, in 1880, a workman employed in the extensive yards of the Nayatt Brick Company was taken with the chills and fever, and by the 23d of the same month there were sixty more of the workmen laid up with the disease, suffering from it generally with high degrees of severity. By the 25th the largest number at any one time (about seventy) were on the sick list. About the 1st of September there was a general subsidence of the disease in those first affected and large lessening of the number sick.

On the 20th of the month of September, however, there was a largely increased number again on the sick list, amounting to nearly fifty.

From that date the number of cases gradually declined from fifteen to twenty every week, and by the last of October of those who had not left the premises but very few, if any, remained sick.

At one time there were about one hundred, including the sick and convalescent, who were disabled from active labor. The whole number sick is stated to have been one hundred and eighty-five, which comprised nearly all the persons employed around the yards.

The disease, however, was not confined to the premises of the brick company. At Drownville, about a mile distant from the brick yards, a farmer, long a resident of that section of the town, was taken with the chills on August 24th, and on the next day a daughter was taken in the same way, and both proved to be intermittent fever. It is said that these were not the first cases that occurred there, but the statement has not been verified, though it may be true. There were from twelve to fifteen cases in and around Drownville. At Prince's Hill, also about a mile distant from the brick yards, there were cases, and in the intervening territory between these points and the brick yards quite a number of cases occurred.

At Nayatt Point proper, three-quarters of a mile distant, it failed to make its appearance, except in one or two instances. Nayatt Point lies directly at the head of Narragansett bay, where it receives the waters of the Providence river, and is separated from the low lands around the brick yards by a ridge of land rising from twenty-five to thirty feet in height. Cases were also reported as having occurred in the town of Warren, about three miles distant from the brick yards, and at intervening places. Some of the cases occurring away from the brick yards were of persons who were employed at the yards, but the larger number had been no nearer than where they were taken.

The occurrence of intermittent fever, affecting so large a number of persons, in a section of country where it had never before been known within the memory of the oldest inhabitant, naturally excited a great deal of interest.

As to the cause or causes opinions vary. A topographical description of the brick yard premises and surrounding territory within which the malarial fever occurred, with the circumstances and conditions which were connected with them during the warm season of 1880, may help the professional mind, if of no others, to solve the question of cause.

An inspection of the map accompanying the description will materially assist in obtaining a clear idea of the location.

This fever and ague district is a shallow basin lying in the southwest half of Barrington, and between Barrington river (which is a stream of considerable width) on the northeast, Providence river on

vision, which, carried like the dancing motes in the atmosphere in whichever direction the air currents moved, found most easy transition in the direction of the brick yards, and so, as the germs of disease, found the largest harvest there?

But whatever may have been the cause, the proprietors design during the coming year to provide, if possible, against a second invasion of the unwelcome visitant. The former status of the salt meadow pond will be maintained through the season, all possibly objectionable material will be removed from the vicinity of the yards, all reservoirs of water kept full, the lodges cleansed thoroughly and whitewashed with lime, the beds renovated and the habits of the occupants subjected to a close supervision.

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## CATTLE COMMISSION.

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In the performance of the duties which had, previously to the establishment of the State Board of Health, been delegated by statute to a Board of Cattle Commissioners, the secretary has found employment in more than half of the days of the year.

The duties imposed by law, comprising the investigation of diseases among cattle and other domestic animals; the devising of ways and means for the prevention and restriction of contagious and infectious diseases among domestic animals, and especially such diseases as are largely or wholly fatal in character, or result in partial disablement and consequent loss in value; have a wide range and require a large watchfulness on the part of the officer under whose supervision they are placed.

It would cover too many pages in this report to endeavor to describe even a part of the large number of cases to which the secretary has been called or relate the incidents connected with them, which have come under his observation, a large majority of which when examined were found of very trifling character; but, as it could not be known without a visit and an examination whether a reported existence of some disease among domestic animals was true to name or not, it was the invariable rule to give every case reported the earliest attention possible.

No largely prevalent disease affecting domestic animals has occurred during the year with the exception of the equine catarrhal influenza or "epizootic" among horses.

As usual suspected cases of pleuro-pneumonia have been reported, but without foundation. Spinal meningitis among horses has been more than usually prevalent in some sections of the State, and of more than usual severity of form.

A form of disease, in which the first apparent symptoms precede the death of the animal but a few hours, has occurred in several places in the State in localities more or less widely separated. It has been

named by veterinary physicians splenic apoplexy, anthrax, the anthracoid disease, &c. So far no cases have been reported as occurring in other animals than horned cattle or the bovine species.

#### GLANDERS.

The disease among animals requiring the most attention has been, as in previous years, that of glanders in horses. The experience of the past year in regard to the discovery and disposal of animals affected with this disease has been but a repetition of that of other years, an account of which has been given in previous reports of the Board.

The difficulty in detecting the disease in its earliest stages from the similarity of the symptoms to other nasal diseases, with the frequent disposition of the owner upon discovery of suspicious appearances to take measures to hide or remove such appearances from general observation, and especially when the symptoms of the disease are more definitely declared to dispose of the animal as soon as possible in places where the disease will be the least likely to be noticed continues to protract the time when the animal will be reported to the Board. At the same time a large number of suspected cases are reported, which upon examination prove to be only nasal catarrh or some non-contagious, acute or chronic disease of the nasal passages.

The number of cases reported suspected of being glanders and not found such far exceed the number found to be glanders or farcy. The proportion of the suspected cases visited to the proven cases is more than four to one.

The tract entitled "Glanders and Farcy" has been kept in supply in places where horsemen congregate, and has been distributed singly to persons whose occupations or pursuits brought them frequently in contact with considerable numbers of horses.

The whole number of cases of glanders that have come to the knowledge of the Board during the year 1880 is forty-nine.

Of these thirty-two were found in the city of Providence, five in the town of Johnston, four in Cranston, three in Pawtucket, two in Cumberland and one each in the towns of Coventry, Scituate and Smithfield. Several of the number found in Providence belonged in other towns.

Some of the cases mentioned were first seen by veterinary practitioners, and treated (on suspicion of glanders) until the symptoms were sufficiently pronounced, and then upon their advice the owners

sent them voluntarily to the horse burying ground provided by the State Board of Health.

Two were found abandoned on the public high way.

A record is kept of all these cases, the time when they occur, the owner's name if known, the place where kept, in town or city, when ascertained, the form in which the disease occurs, *i. e.*, whether glanders or farcy, and the events of killing and burial and by whom.

Persons of means defray the expenses of taking to the burying ground and interment. But there are a considerable number every year who have in possession horses that are glandered, and which are condemned by the Board, who deny ownership of the horses or are too poor to pay for removal and burial, or too irresponsible to trust with the killing and burial themselves, and the expenses are borne by the State.

In the second annual report of the Board there was presented a form of blank return of death of a horse to be filled up by the person at the horse burying ground (Mr. W. E. Barnes) at the burial of every glandered horse found in or within a few miles of Providence city, and to be returned to the office of the Board. The reasons why such returns, with the statements of facts therein made, were desired by the Board are there given. It should also be stated that during the past year the burial of a glandered horses any where in the State within the knowledge of the Board was desired to be reported in the same way.

#### EPIZOOTIC INFLUENZA.

Late in the month of September there appeared among the horses in the northeastern part of the State, and rapidly extending over the whole of its territory, a disease characterized by a manifestation of much lassitude, great indisposition to active exertion, lessened appetite and increased desire for drink, drooping of the head and disposition to assume the lying position in the stall. In some cases the more severe symptoms were ushered in with chills, and fever in a greater or less degree followed. After three or four days from the commencement of the disease free running from the nostrils was established, the submaxillary glands became swollen, dryness of the respiratory passages and cough followed. In a few instances it resulted in pneumonia. This seemed to be the same disease that appeared in 1872 and swept through nearly the whole country, but was in 1880 considerably milder in former. The malady lasted ordinarily from fifteen to

twenty days. Various sequelæ followed, but in a small porportion of the cases only. In Massachusetts, where the disease had previously prevailed, derangement of the bowels was the most frequent sequel; in this State urinary and spinal difficulties and in New York city, where it appeared in November, the principal unfavorable result was a form of purpura hemorrhagica. It is probable that in nearly if not quite every case in which unfavorable results occurred in horses not already weakened by old age or previous disease, that too severe usage when under the influence of the disease was the cause. Before the disease appeared in this State, and for the purpose of giving timely information in regard to the mode of treatment, the following communication was sent by the secretary to the Providence Journal:

#### THE HORSE DISTEMPER.

The epidemic affecting so large a proportion of the horses in neighboring cities, will doubtless manifest its presence in this section in a short time. Indeed it may have already began its initial work. An inspection of about three hundred horses at the State Fair, Wednesday, showed a large number having symptoms of nasal irritation with unusual dryness or slight discharge from the nostrils, but without swelling beneath the jaws.

There need be, however, no serious apprehensions from the advent of this disease as it has now appeared. It occurs very frequently in a mild form, sporadically (scattered cases), and yields readily to simple treatment, or, what in most cases is better than any medication, partial or complete rest, and spare diet, of cut hay with bran, shorts or other mashies, and chopped vegetables. Cooked food has been used with satisfaction. The inherent recuperative forces of the animal are sufficient in almost every case to throw off the disease.

In the epidemic visitations, like the occurrence of epidemic scarlatina and dysentery in human beings, the disease at times assumes a more formidable character, as for instance the epizootic of 1872. That remarkable epidemic, which commenced in Toronto, Canada, in September of that year, spread with regular and rapid progression to all the cities of Canada, and by midwinter had traveled throughout the United States to the Atlantic and the Pacific, Mexico and Central America. The present epidemic has, however, so far exhibited a much milder type. There has been as yet but little of the extreme nervous prostration and organic derangement that characterized that more formidable epidemic.

Indeed, but for the nervous disturbance, and general manifestation of muscular soreness, the present epidemic might with reason be taken to be simple bronchial catarrh, or nasal catarrh, which sometimes affects a considerable number of horses in the spring and autumn. Its extensive prevalence also makes its character pronounced.

It had been previously stated that in some cases at the very commencement of the disease, "the animal is seized with fits of coughing and sneezing, preceded by languor and followed by swelling of the throat, and in serious cases by fever,

with inflammation of the lungs, and sometimes death." It may be added that in some cases, coincident with the disinclination to exercise at the onset of the disease, a slight secretion of a thin, and apparently acrid character may appear within the nostrils, or they may seem very dry, with a yellow hue of the lining membrane. The eyelids will sometimes droop over the eyes, and a free secretion of tears may occur, trickling down the face. The limbs will also seem to be stiff and sore.

Any severe labor during the incipient stages of the disease, will greatly increase the severity of the malady, when fully matured, and thereby endanger the life of the animal.

In addition to what has been said in regard to treatment, it may be stated that the animal should be protected from alternations of heat and cold, should be allowed drink in moderate quantities at frequent intervals, should have well-ventilated stabling, daily or more frequent grooming with the brush and rubbing with the hand, with only gentle pressure over the whole surface of the body; and upon the occurrence of severe fever, or very painful cough, with shortness of breathing, the services of a veterinary expert should be requested.

The first symptoms of subsidence of the disease, will generally be a more copious flow of urine, diarrhoea or profuse perspiration, according to previous severity, a cessation of muscular soreness, and return of appetite.

#### HOOSE OR LUNG WORM DISEASE.

On the eighteenth of October, the secretary was notified that a fatal disease had broken out in a herd of cattle in the town of Cumberland, and that it was supposed to be pleuro-pneumonia.

In company with Dr. C. H. Peabody, veterinary surgeon, a visit was made to the herd, and the disease investigated. As an account of the post mortem examination, and pathological appearances, the symptoms, &c., is given by Dr. Peabody on another page, only matters not alluded to by him will be previously presented.

The disease with which the animals were affected was (so far as any knowledge can be obtained) entirely new in this State. It has been since ascertained that it had been known to have occurred in several localities in the different States, and in the old countries. In some of these localities, it has occasioned extensive destruction of cattle, and caused enormous pecuniary loss.

It has been known under various names, as hoose, verminous bronchitis, pulmonalis verminalis, and in the vernacular, the lung worm plague.

The worm—supposed at first to be a species of filaria—is a very slender, thread-like animal, looking to the naked eye as much like short pieces of fine white thread as anything; the male from one to one and three-quarters inch in length, the female from two to three

and one-quarter inches. The mature female produces a very great number of eggs, which, under the microscope, are found to extend on each side of the alimentary canal, more than two-thirds the entire length of the worm. Each matrix of the eggs appears to be a long tube, in which the eggs are ranged in line in regular order, lying by the side of the stomach and intestines, the coats of which are transparent. It may well be said that everything is transparent about the body of the animal. Under the microscope, the outer investment of the worm, or integument, is seen to consist of two transparent coats or membranes, which move or slide one upon the other when the animal moves with a twisting or vermicular motion, the stomach and intestines, and also the egg matrices, are clearly seen through them, and furthermore, not only are the matrices transparent as before stated, but the shell of the egg, or membrane, that encloses the embryo worm, is also transparent, so that the movements of the embryo worm within the shell are clearly seen through the shell of the egg, the walls of the matrix, and the two movable integuments of the mother worm.

The worm was not considered of a species of *filaria* proper by Mr. N. N. Mason, microscopist, when put under examination, and Prof. A. S. Packard also, upon being questioned, expressed a negative opinion when the first specimen was presented him and a slight examination made. Prof. Packard was interested in the specimens examined, and upon investigation believed them to be a species of *strongyli*, the *strongylus micrurus*.

Dr. C. P. Lyman, the veterinary surgeon connected with the Agricultural Department at Washington, D. C., gave it the same name, and so also did Dr. James Law, professor of veterinary medicine in Cornell University.

A *strongylus filaria* is a lung worm that infests sheep and goats, a *strongylus elongatus*, the air-passages of swine.

The parasite that infests the throat and windpipe of birds, and especially chickens, producing what is popularly called the gapes, is not a species of *filaria* proper, but is technically called *sclerostomum syngamus*. It is a worm of less length and firmer texture.

It is perhaps needless to say that the herd of Mr. Jenks, the owner of the diseased animals, consisting of between sixty and seventy head of horned cattle, were all strictly quarantined at once, and the diseased animals isolated. The disease was not contagious in the sense or way of pleuro-pneumonia, or the Texas cattle disease, but could be very

readily and rapidly communicated from one to another by taking into the mouth the worm, the eggs or young ova, discharged by the coughing or drouling of the animals affected, upon the grass or elsewhere. Healthy animals, feeding upon the same ground, or brought in contact with the diseased animals for a day or two, would exhibit symptoms of the presence of the parasites in from ten to fifteen days.

It was the purpose of the secretary to confine the disease within the limits of the farm where found beyond peradventure.

The herd was visited on the twenty-fifth of October, by Dr. E. F. Thayer, veterinary surgeon and member of the Massachusetts Cattle Commission, who concurred fully with the quarantine regulations which had been established.

Dr. C. P. Lyman, previously alluded to, also endorsed the necessity of the precautions taken, and treatment pursued.

The following account by Dr. Peabody, previously alluded to, was read before the United States Veterinary Medical Association, and will present more fully the symptoms and treatment:

**MR. PRESIDENT AND GENTLEMEN,**—Hoping the following report of so mecases and autopsies made by myself on cattle suffering with phthisis pulmonalis verminalis will be interesting, I beg to ask your attention for a few minutes.

In October, 1880, I was requested by the secretary of the State board of health to accompany him to the village of Ashton, in the town of Cumberland, R. I., to the farm of a Mr. Jenks, and examine some cattle reported as having pleuropneumonia.

On arriving at the farm we obtained the following history: August 25, 1880, Mr. J. bought, in Brighton, 47 head of calves, said to have come from New York State. On getting a short way from Brighton, some of the calves began to cough. They arrived at their destination on August 29. Three or four days after one calf died, and then shortly after, four or five a week, then three or four a day, until we saw them.

The following symptoms were observed: A cough, short and harsh, gradually becoming hoarse, and finally assuming a muffled sound, was detected, the animals having the appearance of great fatigue. The respiration varied from 70 to 112 a minute, and was labored and abdominal, and each breath being accompanied with a slight cough or groan. Some of the calves were constipated, while others had diarrhœa.

In some of them the appetite remained good until 24 hours before death, emaciation gradually taking place. The pulse was weak and irregular. The animals stood with their backs arched; the heads down; the hind legs drawn under the body; the fore feet spread apart, with the elbows turned outwards. Frothy secretions oozed from the nostrils. The coat was staring; the skin shriveled; the eyes dull, and in a few cases there was an abundant discharge of saliva, in which was found contained filaria and their eggs, which had been coughed up. On examination of the thorax by auscultation, there was a peculiar, in some places a crack-



ling sound; in others a loud wheezing, but no complete loss of respiration over any part of the lungs. On percussion, an abnormal resonance was observed over the greater portion of the lungs. The temperature ranged from 103 to 106 F. The duration of the disease varied from 15 to 20 days.

Having obtained the history of the disease, we proceeded to make the post-mortem of some already dead, and of some destroyed for that purpose. The description of the lesions found in one will, with slight exceptions, answer for the whole.

The first animal examined had been dead about 24 hours. In the thoracic cavity, we found an abnormal amount of serum; the membrane lining it was healthy, and the pericardium without patches of lymph or false membrane. The heart was filled throughout with a hard coagulum. The extended surface of the lungs was paler than normal, its tissue emphysematous in places, and slightly mottled in others. Upon cutting through the large bronchiæ we found a large number of thread-like worms, from  $\frac{1}{4}$  of an inch to  $1\frac{1}{4}$  inches in length, and in knots or masses. These were immersed in frothy mucus, which seemed to fill the air-passages completely.

These worms were found in every branch and ramification of the air-passages, to their utmost extremity. A few lobules seemed congested, and in some places the capillary blood vessels were broken down, and slight hemorrhage had taken place, small clots of blood being found in the bronchial tubes. It was noticed that all the tissues of that animal, as well as those of such as were killed, had a sourish smell. The lymphatic glands of the throat and abdomen were enlarged; other abdominal organs healthy.

There was no treatment pursued with the calves, beyond slight fumigations. The other cattle were treated by inhalation of fumes of burning sulphur. The internal treatment consisted of turpentine, iron and gentian, after they had been removed from the place where they had been kept. I have examined the lungs of two of the old cattle destroyed since my first visit, and after fumigation, and have not been able to find any of the filaria.

Allow me now to detain you a few moments longer in order to allude to the size of the eggs of these worms, and to say a word as to the tenacity of life of the embryo. The specimen which I am going to present, I owe to the kindness of Mr. Norman N. Mason, an excellent microscopist, of Providence, R. I. Upon measurement, this gentleman found the egg to be from 1-300 to 1-500 of an inch in diameter. In conclusion, and to show you how long after the animal is destroyed, and no matter what poisonous preparation is used, life remains in the embryo, I will state that the lungs, from which these specimens were obtained, were sent to the office of the State Board of Health on a Tuesday, and the examination made on Thursday. Some of the filaria were then soaked in picric acid and glycerine, from 30 to 40 minutes, and then placed under the microscope, when the embryo could be plainly seen moving in the egg.

## EXPENSES OF THE BOARD, 1880.

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### *Board of Health and Vital Statistics.*

Books, printing returns, circulars, &c.....	\$46 79
Paper, twine, wrappings and office supplies.....	23 53
Postage stamps and postal cards.....	28 00
Expressage and telegrams.....	3 85
Heating apparatus, fuel, cleaning, &c.....	23 01
Traveling expenses of members .....	52 00
Chemical analyses and transportation.....	15 00
	<hr/> \$192 18

### *Cattle Commission.*

Advertising.....	\$29 39
Examination of stables and other places.....	12 00
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## BOOKS RECEIVED, 1880.

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1 "	N. Y., 4th Annual Report Board of Health, Utica, pam.....	1879
1 "	N. Y. City, Sanitary Reform Soc., 1st Annual Report, pam.....	1880
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1880.

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# HEREDITY,

BY

MISS A. E. TYNG, M. D.,

MEMBER OF THE R. I. MEDICAL SOCIETY, THE AMERICAN MEDICAL ASSOCIATION, ETC.

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## HEREDITY.

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The greatest study of human life involves the relations of man with the history of the past and the future. He is the result of that past and the progenitor of future generations.

“Heredity is a biological law, which itself results from another law—that of the transfer by generation of the attributes of physical and mental life, and the laws of generation govern everything that lives—the plant as well as the animal and man. There is not one part of the domain of life subject to the laws of heredity and another exempt from them.”\*

Heredity is a positive law regulating all physical, mental and moral development. The apparent exceptions, which are very rare, will be found not to be such when the subject itself is better understood. The inheritance of any given trait may come from either parent or from both, thus modifying it or producing a variation. It has been found that a check may thus be put upon variation when it is desirable to cause a reversion to the normal type of a certain family, the original characteristics of which, though apparently lost, were really lying dormant.

On this subject much has been written.

- Its influence was recognized by Aristotle, and yet to this day little is generally known, still less acted upon or applied to the daily life of mankind; its laws are less observed and followed than those which result from other scientific studies.

Farmers and stock raisers know that heredity is of importance, and great care is taken to improve the breed. They know that the same or similar laws govern the parentage of men as of animals, but how seldom will the same men think of what they may entail upon their children—deformities, ill-health, physical and mental, traits of char-

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\*Ribot, “Hereditary transmission.”



acter or tendencies to crime. The mental as well as the bodily conditions caused by the good or ill conduct of individuals may be handed down to their offspring, thus influencing them for good or ill, and as children may inherit from great grandparents, it is impossible to say where the end may be. Every child inherits something from its ancestors, it may not always be observable in childhood, but may develop at puberty, or be drawn out by the vicissitudes and discipline of life. The recognition of this has given rise to the sayings, "The child is the father of the man"—"The society of the future is cast in the mould of to-day," and similar others.

These are well admitted and well-known facts, and have been for years—why are they not more acted upon and counteracted as mechanical laws are and thus made useful? People believe in (because they *see* them) the physical resemblances to parents. Next is needed a belief in the heritability of morals, virtues and vices. When this is felt by each would-be parent with a sense of his or her own responsibility therein, there will be some hope of the next step, namely, a belief in the power to modify and counteract by marriage and by judicious physical and moral training.

By studying the laws of psychological heredity man may employ them for the intellectual and moral improvement of the race, thus adapting to his own needs the forces of nature. Spurzheim wrote half a century ago, putting forth the idea that the psychological constitution of parents being known, the intellectual character of children may be foreseen, and by employing similar means as those adopted for animals we could create races or families of able men. And he who shall convince the world of the importance of the laws of heredity and induce people to control their conduct and lives accordingly, will contribute more to their improvement than all institutions of education. "A conscious selection carried on for a long time would have a good result, for law must at last carry the day."\* "Compare the almost naked savage, his brain filled with images and void of ideas, his rude speech, with the man highly civilized, highly refined, initiated into all the niceties of art, literature, science, &c. The distance between these two extremes appears infinite, and yet it has been traveled over step by step."\*

The study of embryology has shown that the child is derived from both parents, and has the characteristics of both, and if there could

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\*Ribot, "Heredity transmission."

be a perfect correspondence of the physical and mental constitution of both parents there might be a perfect child; but these conditions are the results of the previous inheritances of each parent which have thus formed their physiological, psychical and moral characteristics. One parent may have stronger transmitting power than the other, and this preponderance on one side is known and made use of by horticulturists and stock raisers. Cases occur where the influence of one parent seems to have been lost, but it is shown to be only dormant, to be brought out in another generation, and thus the idea of correspondence or equality of action on the part of both parents is again apparent and realized as far as possible. Facts showing cross heredity, that is, from father to daughter, then to her son, are more numerous than those of direct descent to the same sex, so that the third generation is more like the first, and this takes place more frequently with the moral than the physical characteristics.

Dr. Whitehead gives the following list of hereditary diseases: Scrofula, rachitis, phthisis, cancer, mania, epilepsy, convulsions, apoplexy, paralysis, asthma, gout, rheumatism, syphilis, erysipelas, sycosis, quinsy, gravel, cataract, deafness and diseases of dentition. More modern physicians, having the advantage of greater medical knowledge, will differ in opinion as to some of the last of this list, but as there can be no doubt about most of them, it remains formidable enough. "A particular temperament or disposition prominently developed, and especially if existing simultaneously in both husband and wife, will be likely to be reproduced, still further exaggerated, in the offspring, and thus that healthy balance, so necessary to the harmonious discharge of the nervous and circulatory functions is at length destroyed, merging itself in incapability and disease."\*

Dr. Whitehead in his list has not mentioned alcoholism, perhaps because he considered it more a cause of disease than a disease itself. It should be mentioned not only because of its great evil effects, but because the taste and craving for it is inherited, and may continue through several generations. "While probably there is much less alcohol used among the intelligent classes to-day than there was fifty years ago, we must bear in mind, first, that society to-day is reaping the harvest of its use fifty years ago in the form of nervous systems inclined to disease, and second, that there is an increased use of it among the young."† What will be the result of this increase on an-

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\*Whitehead, "Hereditary transmission of disease."

†Dr. H. P. Stearns, Conn.

other generation fifty years hence? Alcoholic intoxication and its effects have attracted much attention for some years. It is now recognized as a hereditary and transmissible disease, and hospitals are established for its cure. As its existence shows nothing but evil to each victim, to their issue and to society, there is no more crying need to which Christian work should turn.

Morel, a French authority on questions relating to insanity, states, "that the whole nature of the descendants of drunkards is often depraved." They are remarkable for apathy, indecision, defective moral sense and many nervous diseases which are transmissible. Children conceived when the parents are in a state of intoxication show intellectual feebleness, which if continued in another generation degenerates into idiocy. This opinion is held by Ribot, Maudsley, Dr. S. G. Howe and many others, whose words are well worth quoting and studying. Morel gives the history of one family which Maudsley quotes\* as a typical example of the course of degeneration proceeding unchecked.

*First generation.*—Immorality, alcoholic excess, brutal degradation.

*Second generation.*—Hereditary drunkenness, maniacal attacks, general paralysis.

*Third generation.*—Sobriety, hypochondria, lypemania, homicidal tendencies.

*Fourth generation.*—Feeble intelligence, stupidity, mania, idiocy and probable extinction of the family.

In a paper on hereditary diseases of the nervous system, Dr. S. Rogers, of New York, remarks: "It is a grave fact that the parent who destroys the organization of his nervous system by alcoholic excesses, is exceedingly liable to transmit to his offspring a disordered nervous system, which manifests itself in almost any form that nervous diseases take," and also, "There are no more striking or melancholy examples of degenerate brain organization transmitted to offspring than that produced by alcoholic excesses."

The tendency of alcoholic inheritance to weaken the procreative powers is spoken of by several authors. "We do not hesitate to proclaim, as a law of universal application, that three successive generations of inebriates will leave no issue. The third generation may have children, but not one of these will be reared to manhood."†

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\*The physiology and pathology of the mind."

†Report of the New York State Inebriate Asylum, 1864.

"Not one of the transmitted wrongs, physical or mental, is more certainly passed on to those yet unborn than the wrongs which are inflicted by alcohol. Many diseases engendered by it in the parent are too often stamped in the child, while the propensity to its use descends also, making the evil interest compound in its terrible totality."\*

Dr. S. G. Howe, in his report on the statistics of idiocy in Massachusetts, states that the habits of the parents of three hundred idiots having been learned, one hundred and forty-five, or nearly one-half, were found to be habitual drunkards. In one instance, in which both parents were drunkards, seven idiotic children were born to them. Dr. Howe also says that "the children of drunkards are deficient in bodily and vital energy, and are predisposed by their very organization to have cravings for alcoholic stimulants. If they pursue the course of their fathers, which they have more temptation to follow and less power to avoid than the children of the temperate, they add to their hereditary weakness, and increase the tendency to idiocy and insanity in their constitution, and this they leave to their children after them."

Knowing all these evils, it is not to be wondered at that the temperance question finds such warm partisans, albeit there have been fanatics; better so than to keep silent, for those who can prevent even one case by their remonstrances and fail to speak, are cowards and cannot be considered blameless.

Heredity is especially observable in nervous temperaments and diseases. Dr. Hammond considers them more transmissible than any other diseases. Americans can be distinguished among all nations for their nervous type; it is shown conspicuously in their restless manners. Where the brain and nerves predominate neuralgia in all its forms and other nervous troubles are to be expected. These diseases are apt to limit themselves to the nervous system, although they transmit themselves in different forms, as epilepsy or chorea in a parent may appear as insanity or imbecility in the child. A nervous inheritance may show itself early in life by a restless nervous temperament, or may need some exciting cause to develop it, and this development may be delayed or even prevented by wise bodily and mental training.

"Persons are daily coming into life to pass their days until death, from beginning to end, below the plane of an average nerve nutrition. They seldom present us with localized, destructive disease, but from

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\*B. W. Richardson, M. D., "Diseases of Modern Life."

first to last lack an average volume of nerve power and endurance, whether mental or physical, and joined with this condition of things, there is undue sensibility; the energy of nutrition is low and recuperative power is feeble. Such persons are frail and puny, they are easily exhausted, usually thin and pale; if females, they are prone to hysteria, to headaches, irregularities in the action of the circulatory organs and neuralgia. They are habitually over-taxed, and in most cases they are to a degree practically inefficient in the affairs of life. They are never well long at a time, seldom seriously ill, but are prone to the myriad slighter forms of neuroses of sensibility, general or special or emotional."\* This is given as a type of "hereditary neurasthenia;" it is a picture which will be recognized by every reader as typical of a mild form of nervous inheritance. These cases should not give up, tamely submitting to such a condition, wretched themselves, an infliction upon their friends; a struggle should be constantly carried on against it. It is necessary to adopt such an occupation and course of life as will avoid exhaustion, but absorbing enough to prevent the thoughts from dwelling upon the myriad slight ailments.

Those who study hygiene have found that man has great power not only to control disease in his surroundings, but has a direct control over himself to prevent and modify diseased conditions. The more he studies these subjects, the more important they become to him, the more easily he understands the various problems which he daily meets in life, and the more he becomes convinced that man has greater control of his health than was formerly thought possible. It is better to be born with will-power (or to learn to cultivate it) to resist disease, than to be helped or cured by others.

"A judicious course of physical and moral training may prevent the development of insanity in a person not too strongly predisposed thereto—and many cases recorded as illustrations of the force of heredity might never have been written had this fact been sufficiently appreciated. Study the weak points in the character, watch the first dawn of conscience in them, or create such by persevering efforts at moral, religious and intellectual education."†

"It seldom happens that a morbid or evil element in the entailed estate of nature can be directly eliminated, but it may be starved and crippled, and finally destroyed by repression and exhaustion. We can only eradicate special disease by the cultivation of special health. It

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\* J. S. Jewett, M. D., "Journal of Nervous and Mental Diseases, January, 1890."

† "Hereditary influence on mental disease." J. J. O'Dea, M. D. New York.

is not enough to keep an inherited defect or evil tendency in abeyance, some healthful quality or property of the nature should be encouraged to overlie and restrain it. Diseases and morbid tendencies do not die out by virtue of neglect alone. They are only to be destroyed by the cultivation of other characteristics of organic form or function; of 'nature' or 'habit' which have antagonistic or incompatible tendencies." \*

Hitherto most of what has been written on heredity has been devoted to tracing from the past—an exceedingly interesting method of studying history—but it is time to make use of these studies, to develop the future from the facts thus gathered. Especial attention should be directed to this idea of restraining a morbid tendency; if instead of looking backward along the line of descent to find excuse for the short-comings in hereditary traits, we also looked forward to see how we can avoid transmitting such traits or taints to the succeeding generation, the result would develop some profitable ideas upon the physical and moral training of the young, the effect of which could not but clearly show improvement.

The first, the most important and decided means of avoiding such transmission is the modification of it which would be produced by marriage into a family in which there was no such taint or tendency, or better still, in which there was a constitution directly the reverse. If two persons marry, in each of whose family there exists intemperance, nervous diseases of any sort, or consumption, there can scarcely be expected any other result than offspring with these same diseases in aggravated forms or too weak to be reared to adult age. The same may be said of nervous or bilious temperaments; of deceitful natures and ugly and hot tempers—for these latter may become the nurseries of criminals. A conspicuous and well-known example of this is to be seen in the Pomroy boy, in Massachusetts. These are all marked features, easily distinguished, easily traced. To avoid the complications of them requires an amount of study scarcely to be expected before marriage, until the future *rights* of the unborn generation shall be more fully recognized than now. Burdach says, "When parents have a dislike to one another they beget ugly forms, and their children are less lively and vigorous." The same result may often be traced through maternal impressions during pregnancy as a result of anger and dislike on the part of either or both parents, to the unborn child. The

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\* "Mental and physical inheritance of children." J. M. Granville, M. D. England.

theory has also been held that the parent who transmits the physical also transmits the moral resemblance.

When a marriage has occurred without any of these considerations, what is to be done in regard to any inheritance the child may have which will not be an improvement on the stock? The ancient Egyptians and the Spartans acted upon the idea of the need of ante-natal education, and the mother's power in influencing it; they took care to surround pregnant women with beautiful things, pictures, statuary, &c. To this should be added, after birth, cheerful, healthful surroundings, an example of wise deportment on the part of the parents; a discipline and training in self-control; occupation, at *all ages*, suitable to the age and physique of the child, and which shall so occupy the thoughts that there shall be no space for apathy, idleness, or infirmity of purpose. Then the school education should be adapted to development in the needed direction on the same principles.

Much advance has been made also in the study of physiology, both by scientists and the community at large. These two—physiology and heredity—must work together for greater improvement in hygiene and sanitary law.

Every physician knows that lives are saved, sickness cured, pains and deformities relieved now, which could not have been so saved, cured and relieved fifty years ago. Part of this is owing to advance in medicine, surgery and chemistry, a still greater part to advance in sanitary matters. The people could help immensely, could save themselves pain, trouble and expense, by making sanitation combat inherited defects. Although it has been said that too much attention in sanitary matters has been given to the external surroundings, to the neglect of the physical organization, yet as these external surroundings have a strong relation to the present physical conditions, they must give a direct and decided aid to the next generation by the improved health and strength given to this, even in delicate families. That such weak families have a tendency to die out, is thought to be an advantage. It may be, if we consider only the desirability of a strong race of men, but history gives indications that a scientific mind may dwell in a weak body, and so a great good be given to the world in spite of inherited physical weakness. Therefore, instead of letting the weak die out, they should be strengthened and improved. Where it is simply weakness, let them marry into very vigorous and long-lived families. But in the case of those well-known incurable, inherited taints, as insanity, consumption, cancer, syphilis, let us pass *laws*, if necessary, to prevent marriage.

If women also understood these laws of the transmission of diseases and vices through themselves to their offspring, would they marry men of whose lives, or of whose ancestry, they knew nothing? They should be taught this, and also be made to feel the responsibility of parents therein, and not to consider that a bad child is an infliction, or a discipline sent by a just and all-wise God. They should realize that on them depends the regeneration of the world, the welfare of society in the future, for children are stamped before birth with tendencies for good or for evil. The children thus burdened with their parents' sins and their consequences, have a harder struggle in life, and if they lack either the knowledge, desire or power to throw off the burden, it is handed down to the next generation, entailing upon it an increased physical weakness, and a consequent apathy.

This should be repeatedly taught, set before the eyes of all, and that no one may shield himself behind the fact of hereditary taint, the idea should also be constantly and carefully inculcated, that by judicious physical and moral training, suited to each case, the inheritance may be counteracted, or its full development prevented—thus lessening the burden handed on to the next generation, who in their turn, carefully following a similar training and care, and having the further advantage of the modification which a suitable marriage may bring, may totally eradicate the family inheritance.





## HOUSE DRAINAGE.

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BY THE SECRETARY OF THE BOARD.

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So large a proportion of the families in the State of Rhode Island live in houses having connection by means of soil pipes, water and sink pipes, with sewers, underground drains and closed cesspools, that it would seem scarcely possible to call public attention too frequently to the dangers that menace so large a percentage of the people.

It is not the object of this short paper, to point out the dangers arising from the introduction into the house or work-room, of the poisonous gases set free from decomposing excretæ, or the greasy, soupy, and vegetable and animal refuse of the kitchen and sink, undergoing decomposition and volatization, strewed along and adhering to the inner surfaces of the pipes, or accumulating in larger masses of putrefaction, in the sewers, closed cesspools, or sluggish underground drains.

Nor is it designed to discuss in any measure the questions appertaining to sewers or sewerage, but simply to allude to methods by which the apartments of the house may be protected from the inflow of poisonous gases, malodorous or odorless.

The illustrations employed to give a clearer conception of the plans set forth and apparatus recommended, are from electrotypes kindly loaned by C. E. Philbrick, Civil Engineer, Boston, Mass., and are those recently used to illustrate a publication of the lectures delivered by him, before the School of Industrial Science at the Massachusetts Institute of Technology. This compact and concise work\* ought to be in the hands of every intelligent householder. Upon the questions of ventilation, sewerage and house-drainage, the principles are tersely stated, the essential points promptly taken up and clearly treated, the

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\* American Sanitary Engineering, 1881.

methods that seem to promise the best results are presented and explained, without any approach to verbosity.

This paper is in no sense designed to be taken as original in the points presented, and free use may be made not only of the ideas but perhaps of the language of the author alluded to above. Any repetition of suggestions and quotations from former reports of the Board, may be made use of as occasion for the same shall occur.

#### OUTSIDE OF THE HOUSE.

To begin at the foundation of the house, there must be a main drain to carry the flowage from the house to the sewer or cesspool. Such drains are shown at the bottom of Figures 1 and 2. For security against settling of the ground, or foundations of the building when running through it, or changes that result from freezing of the ground through which the drains run, and other sources of danger to earthenware or stoneware pipes or drains, it is better in the first place to procure iron drain pipe of proper size and thickness. Not that iron pipes will allow negligence in the placing or the packing underneath and around them, or in securing a fairly solid foundation for the house, but that it will bear a much greater strain in every direction than stoneware, and so avoiding many breaks to which the more brittle drain is liable, it gives a fuller assurance of safety, which of itself would be worth the additional expense.

But of whatever material, the drain pipe must be smooth inside, of sufficient calibre to carry along freely all the wash of the house, and if connected with rain-water pipes from the roofs, should be large enough to deliver the flowage from them also, without backing any of the contents into sink or soil pipes. A four inch pipe will answer all purposes for ordinary household use, and allow of flushing or washing out with rain water in ordinary quantities. The sections of the drain should always be jointed with lead.

It hardly need be said that the outside and under ground drain, should have sufficient inclination to enable thin sewage to flow with considerable rapidity, and that nothing should go into it from the house that would not pass through an ordinary strainer in the sink. And it should not be forgotten that where one drain enters another, it ought not to be at right angles but at an inclination or oblique direction, and with what is called a Y branch.

As gases accumulate in all sewers, cesspools and drains, and by passing up through drains and sink or soil pipes into the warmer at-

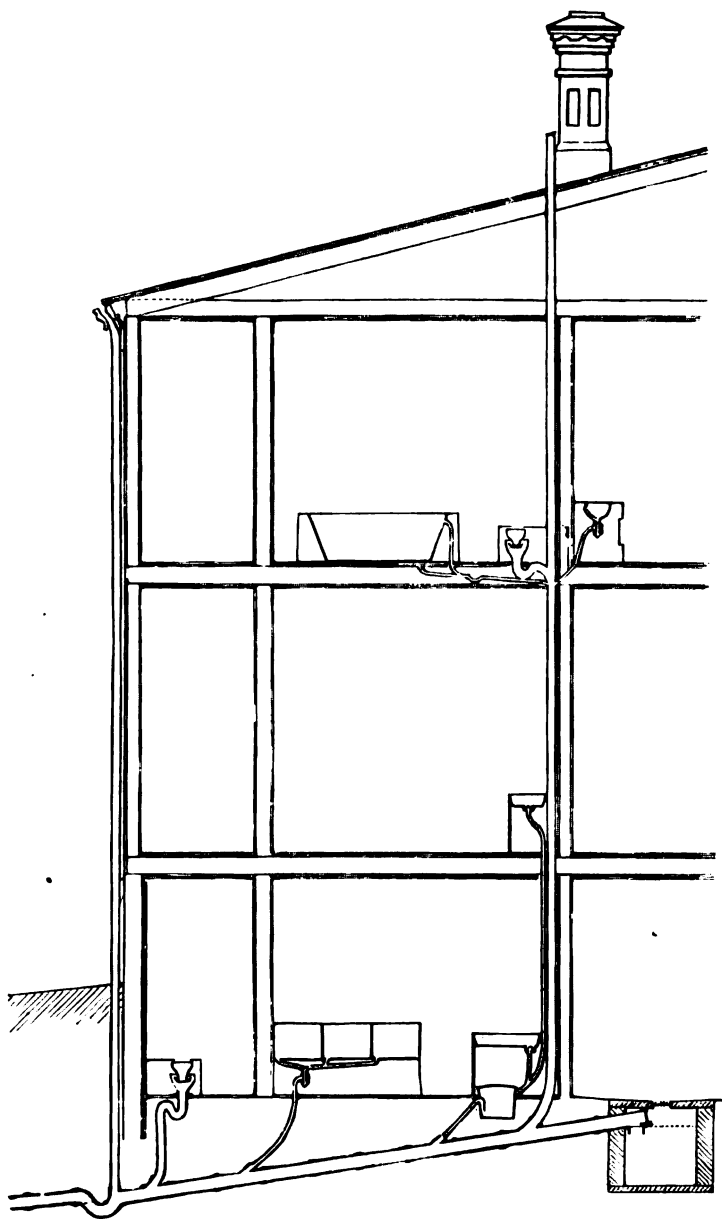


FIGURE 1.

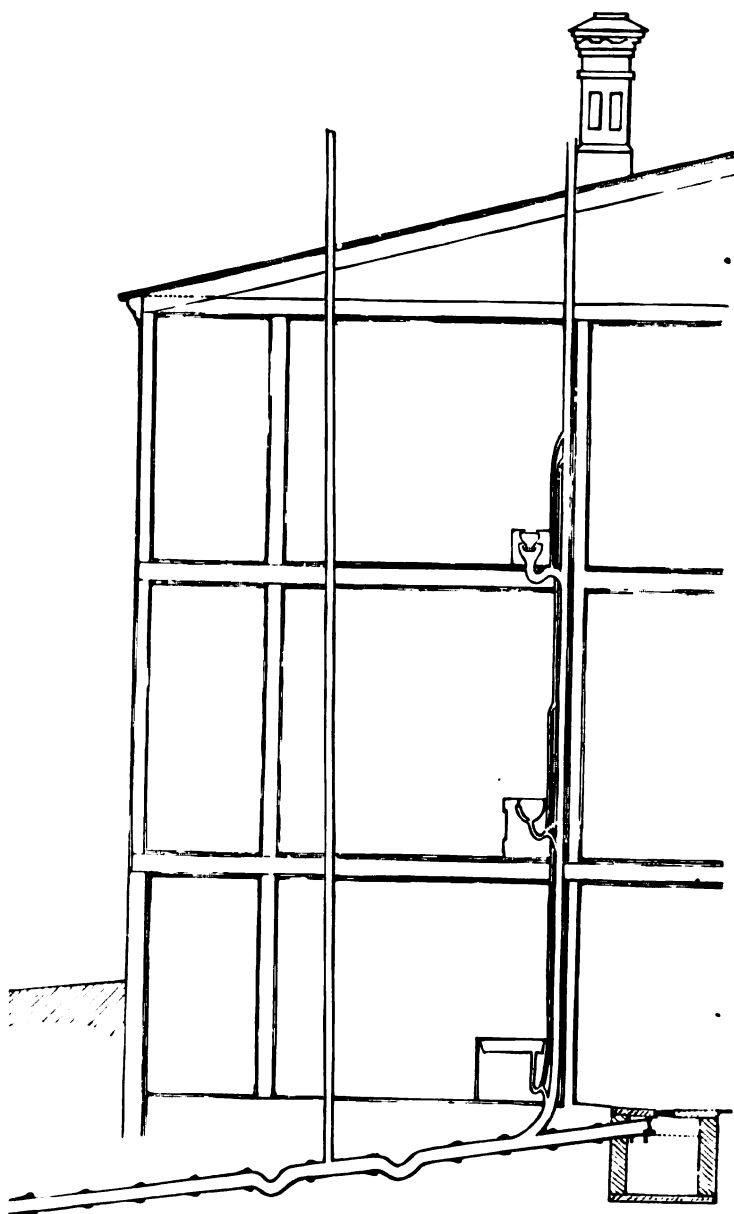


FIGURE 2.

mosphere of the buildings they drain, various means have been devised to prevent this upward flow. Among the first devices was what is called a trap, which is simply a bend in a tube, or section of a drain or pipe in the form of a half circle or that of the letter S. Illustrations of the different forms are shown in Fig. 1, at the bottom of the left hand side, and in Figures 3 and 4.

FIG. 3.

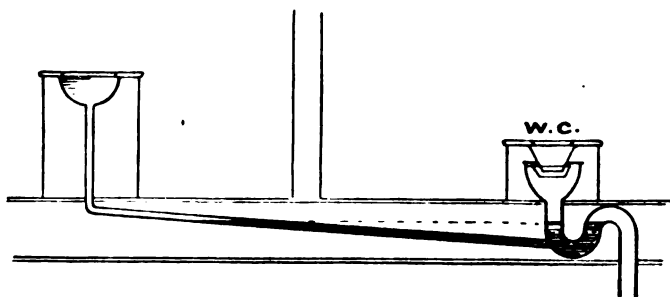
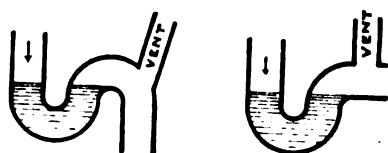


Figure 3 represents a faulty arrangement of pipe, which will be considered on another page. It will be seen that the design is to have a place in the drain or pipe always full of the flowage, and in such a way that as new flowage runs along, it displaces the contents of the bend or trap, pressing the successive fillings forward until all has passed, and still leaving the trap full every time. To accomplish this

FIG. 4.



S TRAP.

in the direction in which the fluids run, must be with a short bend higher than the inlet into the trap, or else the bend must be nearly a quarter of a circle below the level of the straight pipe. See Fig. 1, at the left hand at bottom; also see Fig. 2, where there are two bends

in the outside drain, which were designed to represent traps, but they do not constitute traps, because the bends are not deep enough.

The fluid or semi-fluid contents of the trap is called the seal, and to a very considerable extent does intercept the passage of gases. When a trap is emptied of its contents, which sometimes occurs from suction, (syphonage,) as when a vacuum is produced below it, or a large quantity of fluid is forced into the drain below or through the trap suddenly, and especially if there be obstruction above; and some-

times from being blown out by condensed air forced down suddenly and rapidly by external pressure, the seal is said to be broken, and then offers no obstruction to the free passage of the gases. The traps when sealed, however, do not *wholly* intercept the flow of gases, as the fluid contents of the traps, or seals, absorb moderate quantities, and especially when condensed by a strong pressure from below; the absorbed gases are then set free by the agitation of the seal from the currents of the flowage to some extent, and by slower elimination at the upper end of the trap or seal, because of their lighter specific gravity.

It is now a rule that there should be two traps in the outer main drain, and a ventilating pipe between them, which should extend above the roof of the building. See left-hand ventilating pipe in Fig. 2, between what was designed to represent two traps. By such an arrangement, it is supposed that all the gases collecting below the ventilating pipe will be entirely discharged, because the obstruction of the second trap would divert the flow upwards through the ventilating pipe.

Wherever cesspools are the only receptacles of house drainage, and not very near the building, the use of the outside ventilating pipe might be dispensed with, by providing free ventilation of the cesspool, and fixing one trap not far above the outlet of the outside drain into the cesspool. But wherever the drain may lead, one trap at least should be above free ventilation, and be itself accessible for occasional examination, by an opening called a manhole. (See Fig. 5).

"In laying the house-sewer or outside drain too much care cannot be taken to secure air and water-tight joints. They should resist alike the escape of the sewerage into the surrounding soil, the entrance of subsoil water, and the minute rootlets of trees and plants, which in search of moisture seek out and force themselves through the smallest apertures in drains and sewers, thus causing the sediment to collect, and finally choke up the sewer."\*

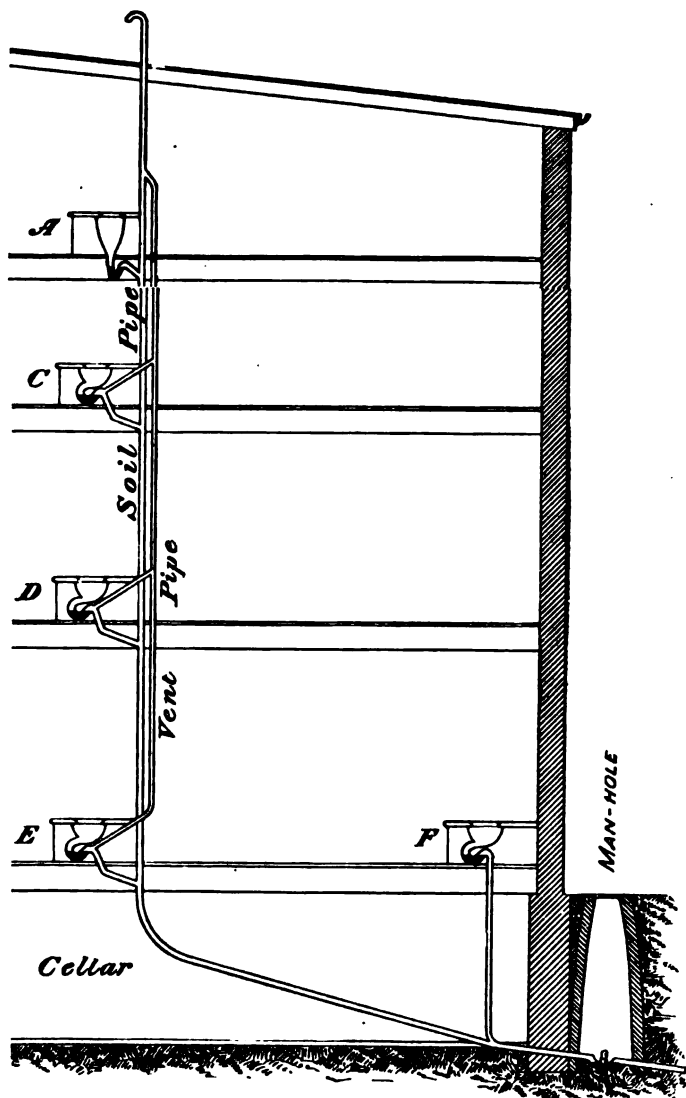


FIG. 5.



## INSIDE OF THE HOUSE.

"Drains within the house walls demand more care and skill than the drains outside. In the latter case the soil has certain absorbent powers, combining chemically with the products of decomposing filth, or holding air in its pores for the oxidation of its noxious compounds, which are thus rendered innocuous. Moreover, the poisonous influences within the walls are more likely to be absorbed by and act upon our systems through the lungs than if out of doors, where they are diluted more or less by the outer air."\*

The above statements are settled facts beyond controversy, and cannot be too strongly impressed upon the minds of those who occupy houses in which any lengthened system of sink pipe or waste pipe drainage is constructed, and more especially if soil pipes are added thereto. It will be understood that by waste pipes are meant pipes that carry only waste water from wash basins and bath tubs, and by soil pipes those that carry away the excretæ and wash of privy closets and urinals.

In the plumbing of a house, it frequently happens that the basement or kitchen sink, wash bowls, &c., can be readily connected with the outside drain (see Fig. 1). With a good sized ventilator outside the house, running to the eaves trough, and above one trap as in Figure 1, and at the centre or farther corner of same side a large inside drain pipe extending above the roof, as seen also in Fig. 1, and especially with traps of approved form, as the Adeo traps (see Fig. 7), it

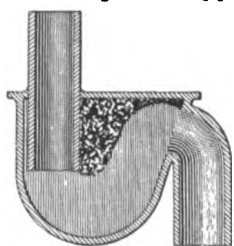


FIG. 6.

would seem that all gases must be most effectually excluded from the rooms. It must be admitted that such an arrangement would practically afford a very large degree of security. There might, however, be an elimination of putrescent gas from the adhesion to the sides of the sink pipes of greasy, cheesy, gelatinous and starchy washing of pots, griddles and platters, which, remaining in the pipes above the outside main, and which, by the simultaneous descent of a rapidly falling column of rain water in the outside eaves through ventilator, as represented at left hand of Fig. 1, and an equally rapid descent of waste water in the inside drain, as shown at right hand of same Fig., would be blown through the ordinary S trap without vents, or the D

\*American Sanitary Engineering.

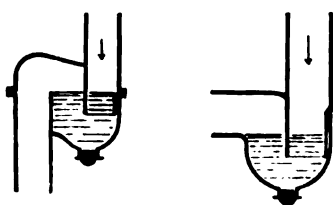


FIG. 7.

trap (see Fig. 6), or perhaps even the Adeo trap (see Fig. 7). It will be seen that in such cases the outside ventilator should not be connected with the eaves trough, or if so connected there should be vent pipes (see Fig. 4) to the traps, leading by some arrangement to the inside drain or to the outside atmosphere.

It is better to have a single inside drain for all the drainage of the house, and which shall be not only a drain, but by extending through the house and above the roof, constitute also a most effectual ventilator (see Figs. 1, 2 and 5).

This inside drain and ventilator should be of the same, or nearly of the same size as the outside drain. It should also be smooth inside and have well leaded joints, with the lead flowed in and tamped. A four inch drain is of sufficient size for a large household, and is the best size for a small household. It is always best to have all the sinks, set bowls, bath tubs, water closets, &c., as near the upright inside drain as possible, (see Fig. 5) so that the pipes leading to the inside drain may be as short as circumstances will permit. The object is evident. The fall from the sink or apparatus to be drained should be such as to give the pipe an inclination sufficient for rapid flow of contents and open into the inside main drain in an oblique direction, so that no flowage from above will be driven into the pipe while descending.

Sometimes a pipe from a bath tub or wash bowl has been laid below the floor, running the length of a room or perhaps two rooms, and connecting then with a sink or soil pipe trap (see Fig. 3). It is needless to say that such an arrangement would be exceedingly defective by allowing a backward flow and deposit of water closet excreta, or the dirty washings of the sink.

The waste and soil pipes may be of lead of good quality, smooth inside and of sufficient thickness to insure stability. This material by its flexibility, allows of bending in conformity to the circumstances of the location, and might thereby be a source of some danger from being allowed to run at too great a length and subjected to too frequent bends, by which the flowage would be returned and adhesion of waste material to the sides be facilitated.

Surmounting every waste, sink or soil pipe and connecting with the wash basin, sink, &c., a sufficient trap is indispensable. Further sug-

gestions in regard to traps may be in order. The purpose of intercepting the inflow of noxious gases, was stated at some length when the subject of outside drains was considered. It now remains to allude to some of the different kinds of traps, their characteristics, adaptation to purpose, fitness and defects.

The first and most frequently used is the old S trap previously alluded to (see trap. of bowl letter F, Fig. 5). The defect of this trap is that it does not wholly exclude the inflow of gases. This may occur in a small measure from the absorption of gases by the seal (or contents of the trap) and eliminating the same from the inner surface. It may give free passage to noxious gases by being emptied, *a.* by evaporation of the seal, *b.* by syphonage or suction when the first connecting pipe below the one to which the trap is attached, runs full and carrying or driving the air before it.

The last might occur frequently, the first if unused for a few days. It may also be emptied by a strong atmospheric blast brought to bear suddenly and forcibly upon the seal.

The merit of this trap is, that the current of flowage through it, fills and moves with nearly equal velocity, through its entire calibre, consequently no deposits form as in some others (see upper surface of D trap Fig. 6). In the D trap it will be seen that by deposit in the upper part where the current does not disturb it, it is simply converted into nearly the same thing as an S trap, and is then no safer from being emptied by blasts of air. It may be as well to mention here that various traps have been invented to meet the defect in the S trap, in regard to being emptied by atmospheric pressure. Among them, and the most common, is the D trap already described, and the round and flat bottomed bottle traps. The bottle traps have a screw cap fitting in the top, by which the traps may be opened and cleaned. This cleaning however is so universally neglected that the bottle traps are not to be recommended.

Probably the Adece traps (see Fig. 7) quite as fully as any other, and with as few defects, secure the seal from breaking by syphonage and by atmospheric blast. They are equally free with the S trap in avoiding filthy deposits quite as foul as that of the sewer and cesspool.

There is, however, a more complicated trap, designed to avoid the

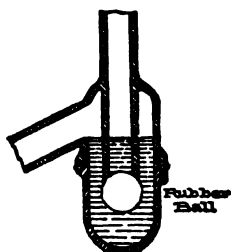


FIG. 8.

breaking of the seal by syphonage, and prevent the inflow of gases, which accomplishes the object quite effectually when the trap is full, and the seal is not so likely to be broken by evaporation. (See Fig. 8.) It will be seen by the illustration that it consists of a pipe or cylinder projecting downwards into a cylindrical pocket, which contains the seal, which is secured by a ball valve, or ball float-

ing up against and closing the mouth of the descending pipe. Small pieces of wood, lint or any floating material that might get into the trap, might for the time being, break the entire security of the trap.

The old S trap with a vent pipe leading to the outer air, (see Fig. 4,) is however the trap which has been heretofore most in use, is now, and probably will be for a long time to come. Perhaps the statement, "with a vent pipe," is not exactly correct, as probably heretofore many more have been used without the vent than with, and when the suggestion is made that the vent pipe should lead to the outer air, it is to be understood that it is meant to be conveyed above the house in the drain inside or ventilator or by a flue.

It will be seen in Fig. 5, that the vent pipe of all the traps of bowls C, D and E, open into a ventilator, or vent pipe separate from the inside drain, until it is connected with that drain above the water closet in the attic.

It has previously been suggested that if vent pipes are allowed to open into the main inside pipe and ventilator, it should be at such an angle as to prevent any ingress of fluids from the main drain. By far the best and safest plan is, by an obliquely upward vent pipe opening into a separate ventilating pipe, as in Fig. 6.

#### MODERN IMPROVEMENTS.

It is not to be denied that there have been in late years many clever contrivances introduced into the dwelling which have been of great convenience to the occupants. Whether these conveniences have all been promotive of the best welfare of the individuals in whose service they were used, is a question which probably all sanitarians would decide in the negative.

Sinks are not new, and are universally admitted to be necessary adjuncts to every dwelling.

The wash bowl and bath tub also contribute so largely to the preservation of health, and add so little to the dangers of foul drains that they may well be named as necessary appendages to every dwelling.

In respect to water closets and urinals, the question assumes a different aspect. It cannot be said that they are necessary appendages, and they cannot be claimed to be conveniences of a very high order; while as nuisances of a decided character and sources of ill-health to those who tolerate and use them, it can be said that it were better for every household if they had never been introduced.

The indolence and effeminacy which they engender may be added to the deterioration of the vital forces, the lessened capacity for physical exercise and endurance, and the increased susceptibility to attacks of disease.

The water closet is in such common use in the best houses in the State, that some general description will be given of the kinds most in use and most preferable if to be put into use.

#### THE PAN WATER CLOSET.

The Pan Closet, as shown in Figure 9, is in such general use, and in

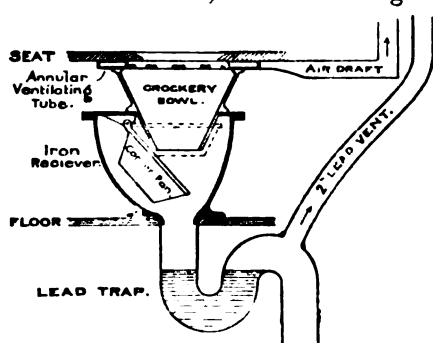


FIG. 9.

the popular estimate has so many advantages to recommend it that it may well be the first one to be described.

This pan consists of a trap, usually constructed of cast iron, and three or four inches in diameter, with a vent pipe at the outer curve between the seal and the connection with the soil pipe. This trap is sometimes made of lead, but of whatever

material, the inner surface should be quite smooth, so that no roughness shall obstruct the rapid flow of the current through it, or catch particles of excretæ in the passage.

Next above the trap is what is called a receiver, made of cast iron, (which should always have an enameled porcelain lining,) and which has an opening in the top sufficient to receive the closet bowl to about half its depth, where it is securely fastened by cement or putty. The receiver has a flange at the bottom by which it is fastened to the floor through which the trap pipe is connected with it. Within the iron

receiver is a copper pan which is so hinged that it can be raised up against the crockery closet bowl, which has a circular opening at the bottom, and when in this position and full of water, the closet bowl will be about one-quarter or one-third full of water. While water stands in the closet bowl held by the copper pan it constitutes a second trap. After the closet has been used the contents are immediately dropped into the iron receiver and thence into the trap below by lifting a handle connected with the copper pan, the contents of which are also emptied at the same time.

“To a superficial observer this seems to be a perfectly safe device. The circulation between the soil pipe and the room is ordinarily guarded by two traps, and as the pan is supposed to be kept full of water, the fecal matter is dropped directly into this water, and becomes thereby somewhat deodorized. But though so popular this closet is a very defective one, and often becomes a great nuisance in the house from the following causes: The cast iron receiver is soon smeared and spattered with filth all over its interior, which goes on accumulating by successive splatterings, till the decomposition of this foul lining, kept moist and warm, keeps the interior filled with foul odors. In fact it violates the cardinal principles of house drainage, by affording a harbor for the continual and certain accumulation of filth within the house.”\*

There are various ways in which the foul air engendered within the iron receiver finds ready exit.

The connection of the handle with the copper pan, the hinge or pivot which allows the pan to be raised or lowered, the cracking away and breaking up of the cement or putty fastening of the closet bowl to the iron receiver, these allow streams of attenuated noxious gases to be continually poured into the room and the house, while every lowering of the copper pan and emptying it of its contents, allows free passage to, and in some measure forces up, the poisonous gases that have accumulated within the foul receiver.

Whatever devices have been adopted to obviate the defects of this pan closet, have so added to its cost as to remove the principal merit (cheapness) which has brought it into such universal use. Persons having such closets and indisposed to remove them, should see to it that the interior of the iron receiver is frequently and thoroughly cleansed with water warm or otherwise, and then drenched with a solution of sulphate iron, (green copperas) one pound to the gallon of

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\*American Sanitary Engineering. Philbrick.

hot water. A window may also be kept open in the closet room when the weather will permit.

Water closets having direct communications with the trap below, (see Fig. 10) or like the pan closet with receiver as previously described, (see Fig. 9) may have ventilation of the closet or closet bowl to some advantage by means of an air draft through a pipe or tube leading to the chimney, or to the vent pipe of the trap. These may be made of zinc or tin, can run under the wood covering and be round, flat or square as might apply best. They can of course only be operative when the lid or cover of closet is closed. Air drafts are seen in Figs. 9 and 10.

#### THE HOPPER CLOSET.

The hopper closet (see Figures 10 and 11) has not heretofore been very popular.

FIG. 10.

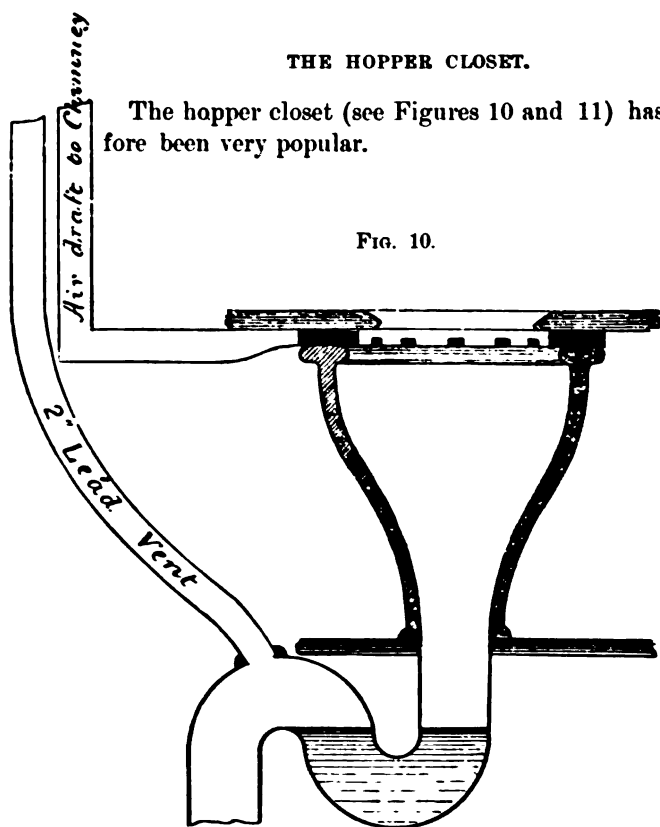
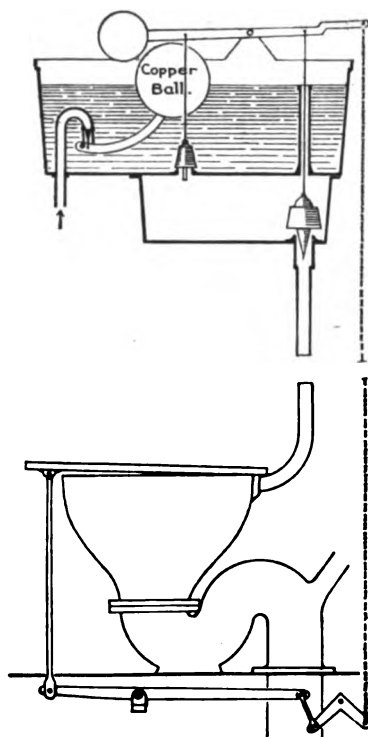


FIG. 11.



TANK WITH AUTOMATIC SUPPLY.

The difficulty in keeping the inner surface of the bowl clean, and the uncleanness being so apparent to the observation, have made this form of closet so objectionable as to greatly lessen the demand for its use. As now constructed, the former defects are to a great extent remedied, and with the automatic water supply, illustrated in Fig. 11, it furnishes a closet nearly if not quite as desirable as any in the market. The closet bowl, of glazed crockery, or porcelain enameled iron, and the apparatus for water supply, furnishing a rapid, dashing current all around the bowl while in use, and thus washing everything directly into the trap and through it, leaves but little to be desired. It will be seen by reference to Fig. 11, that the water supply is regulated by apparatus put in motion by the weight of the person using the closet, that it is continued during use and no longer, unless for special purpose. The amount of water is sufficient for the desired purpose, and there is no waste when the object is accomplished. The form of

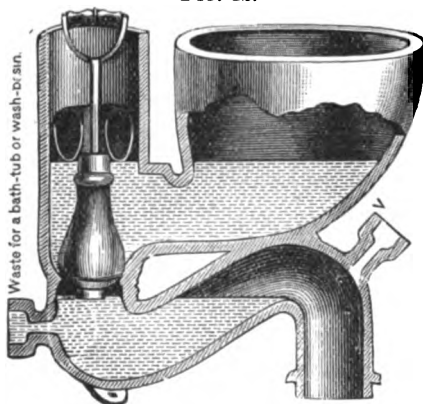


short hopper, as seen in Fig. 11, is preferable in some respects to that of the long hopper, as seen in Fig. 10. The water can rise higher in the bowl, and therefore more likely to cover all the surface where the excretæ might adhere.

#### THE PLUNGER CLOSET.

The styles of plunger closet now offered in the market are quite

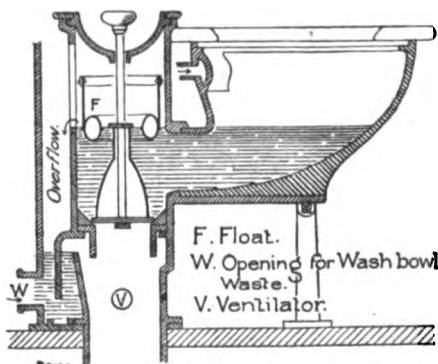
FIG. 12.



PLUNGER CLOSET.

numerous. They are of comparatively recent introduction, at least in the present forms. Figures 12 and 13 will represent quite well this class of water closets, with traps and without. They consist of a bowl, free of any apparatus within itself, but along by the side of the bowl rises an upright cylinder, within which is a float that governs the supply of water, and the plunger that retains the water at the desired height in both cylinder and bowl. A stirrup-like or knob handle surmounts the plunger at the top, and the water and other contents of the bowl and cylinder are discharged when desired, by lifting the plunger with the handle.

FIG. 13.



TRAPLESS WATER CLOSET.

“The advantages of this sort of closet are in its definite and adequate supply of water, maintained at such a height as to be sure of receiving all the fecal matter, and to thus avoid the soiling of the bowl by having it drop upon a dry surface, as sometimes happens in hopper closets. The disadvantages are in the liability of the float chamber to become foul by degrees by filth adhering to its sides. Those patterns which have the smallest float chamber

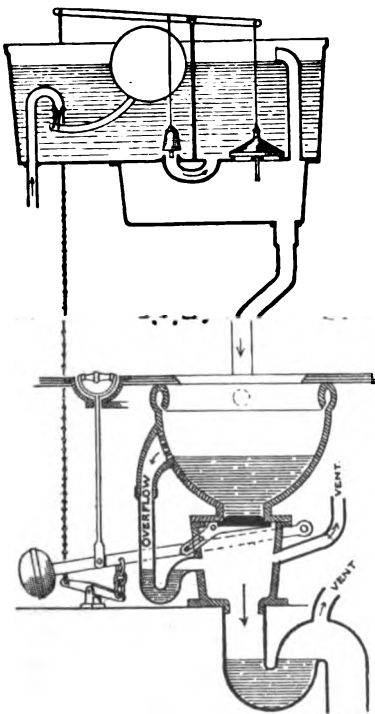
are, therefore, the better ones. All the plunger closets take their water

supply through a valve attached to the apparatus, governed by the float, and governing in turn the supply of flushing water. The construction of these valves is various, and their action is not always reliable, which has at times caused considerable annoyance. If these valves can be made more certain in their action, and the float chamber made more accessible for frequent cleaning, the apparatus can be made a more satisfactory one."\*

These closets have the advantage also of flushing the drain below, whether trapped or not, with such a volume and impetuosity as to aid very materially in keeping the surfaces clean of adhering fecal matter. This, however, may at times also be of disadvantage by syphoning traps of pipes connected with the same soil pipe.

#### THE VALVE CLOSET.

FIG. 14.



VALVE WATER CLOSET AND  
SUPPLY TANK.

This closet is different from other kinds in having the opening at the bottom of the closet bowl closed by a valve (see Fig. 14) hinged on a pivot and connected by an arm to a lever, which terminates at the free end with an iron ball.

The weight of the ball serves to keep the valve close against the base of the bowl, and the lever when lifted by the handle at the side of the seat, serves to open the bowl by depressing the valve, and discharging the contents of the bowl into a chamber below, opening directly into the trap. The chamber is ventilated by a vent pipe between the base of the bowl and its connection with the trap. The bowl has an overflow pipe also connecting with the chamber, but this overflow pipe is trapped near the chamber to prevent the transmission of gases through the pipe into the bowl and house. The water supply from the tank above is also governed by the

handle of the lever.

\*Philbrick, "Am. San. Engineering."

The advantages of this closet are that the bowl is kept sufficiently full of water, while the valve is in order, and it is hardly as liable to get out of order as some other kinds, the chamber receiving the contents of the bowl is small in proportion, and the sudden rush through it helps to keep it cleansed, and the vent pipe of the chamber carries off the noxious gases quite effectually if it communicates with a flue or ventilator opening above any soil pipe. There are some disadvantages however, and it should always have a special and adequate tank.

# APPENDIX.

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## THE REGISTRATION LAW OF RHODE ISLAND.

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### GENERAL STATUTES, CHAPTER 77.

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#### OF THE REGISTRATION OF BIRTHS, DEATHS AND MARRIAGES.

(As amended June, 1875; April, 1878, and March, 1879.)

SECTION 1. The town clerks of the several towns, or in lieu thereof, any person whom the board of aldermen of any city, or the town council of any town, may appoint for that purpose, are hereby authorized and required to obtain, chronologically record and index, as required by the forms prescribed by the third section of this chapter, all information concerning births, marriages and deaths, occurring among the inhabitants of their respective towns; and on or before the first Monday of March, annually, to make duly certified returns thereof to the Secretary of the State Board of Health, for each year, ending on the thirty-first day of December, accompanying the same with a list of those individuals, required by law to make returns to him, who have neglected the same, and with such remarks relating to the object of the law, as they may deem important to communicate.

SEC. 2. The Secretary of the State Board of Health shall receive the returns made in pursuance of the preceding section, and annually make and publish, not exceeding one thousand copies, a general abstract and report thereof, in form as prescribed by section third of this chapter. The Secretary of State shall then cause said returns to be arranged, full alphabetical indices of all the names to be made, the whole to be bound in convenient sized volumes, and carefully preserved in his office, for which he shall receive the sum of fifty dollars.

SEC. 3. The blank forms required to carry out the provisions of this chapter shall, on application, be furnished by the Secretary of the State Board of Health, to clergymen, physicians, undertakers, town clerks, clerks of the Society of Friends, and other persons requiring them, substantially after the following forms, viz.: The record of a birth shall state the date and place of birth, name and sex of the child, whether living or still-born, the name and surname, color, occupation, residence and birth-place of the parents, and the time of recording,

so far as the same can be ascertained. The record of a marriage shall state the date of the marriage, place, name, residence, and official station of the person by whom married, names and surnames of the parties, age, color, occupation, and residence of each, condition, (whether single, widowed or divorced), what marriage, if second, third, or other marriage, the occupation, birth-place, and name of their parents, and the time of recording, so far as the same can be ascertained. The record of deaths shall state the date of death, name and surname of deceased, the sex, color, and condition (single or married), age, occupation, place of death, place of birth, names and birth-place of parents, disease or cause of death, and the time of recording, so far as can be ascertained.

#### OF MARRIAGES.

SEC. 4. Every Society of Friends, clergymen and all others, authorized to join persons in marriage, shall make a faithful record of every such rite performed by them, in manner and form aforesaid, and return the same on or before the second Monday of every month, for the last preceding month, to the clerk of the town in which such rite shall have been performed; and no marriage shall be solemnized until the parties shall have signed and delivered to the authority about to solemnize it, or the clerk of a Society of Friends, a certificate containing the information required for the record of a marriage, as prescribed in the third section of this chapter.

#### OF BIRTHS.

SEC. 5. The clerk of every town, or in lieu thereof, some person or persons whom the town council of any town, or the board of aldermen of any city, shall appoint for the purpose, shall, annually, in the month of January, collect the facts required by section third of this chapter, in relation to all children born in the town during the year ending the thirty-first day of December next preceding, and for each full report of a birth so obtained, shall receive therefor such compensation as the town council or the board of aldermen of their respective towns or cities shall determine, in lieu of such compensation as may now be fixed by law. (By Chapter 782 of the Public Laws, the cities of Providence and Newport are exempt from the provisions of the preceding section, in relation to time of collection and compensation.)

#### OF DEATHS.

SEC. 6. "Whenever any person shall die or any still-born child shall be brought forth in this State, it shall be the duty of the physician attending at such bringing forth or last sickness, if any physician so attended, within forty-eight hours after such death or bringing forth, to leave with the family, if any, or person having the care of the deceased or the person bringing forth such still-born child, or to give to the undertaker or person who conducts the funeral, a certificate stating, in case of a death, the name of the deceased, the date of the death and the disease or cause of the death, and in case of the bringing forth of a still-born child, the date and the cause of such child being brought forth still-born."

## OF UNDERTAKERS.

SEC. 7. There may be appointed by the town authorities of every town, a sufficient number of persons to act as undertakers, removable at the pleasure of the authorities.

SEC. 8. The undertaker, or the person who shall conduct a funeral, or who shall bury or deposit in a tomb, or who shall remove from this State or otherwise dispose of the remains of any deceased person or still-born child, shall first obtain the physician's certificate required by Section 6 of this chapter, if a physician was in attendance upon such person who has deceased, or the person bringing forth such still-born child, and shall return the same, together with his own certificate of the facts required by Section 3, as hereby amended, on or before the second Monday of the next succeeding month to the clerk of the town where such death or bringing forth took place.

SEC. 9. Any town may enact municipal laws, more effectually to attain the objects herein contemplated: *Provided*, they do not conflict with the main and specific object of this act, viz: to procure the most perfect registration.

## OF FEES.

SEC. 10. The town clerks, or persons recommended and appointed as aforesaid, shall receive for each record of a death made and returned as required by law, and for each record of a marriage made and returned as required by law, twenty cents, to be paid to them out of their respective town treasuries; *Provided*, that the yearly compensation to be paid out of the town treasury as aforesaid, to any one town clerk or person appointed as aforesaid, who shall faithfully perform the duties prescribed by this chapter, shall not be less than five dollars. Undertakers and others making returns of deaths as required in Section 8 of this chapter shall receive for each full report of a death made to the town clerk, five cents in the cities of Providence and Newport, and ten cents in the other towns of the State.

SEC. 11. If any clergyman, physician, undertaker, town clerk, clerk of any meeting of the Society of Friends, or other persons, shall willfully neglect or refuse to perform any of the duties imposed on, or required of him, by this chapter, he shall, at the discretion of the court trying the case, be fined not exceeding twenty dollars for each offence, one-half thereof to the use of the town in which the offence shall occur, the other half to the use of the person who shall complain of the same.

SEC. 12. In order that it may be more surely ascertained that no clergyman, physician, coroner, undertaker, or clerk of the Society of Friends, neglects to make the returns specified in this chapter, each of the said parties shall cause his name and residence to be recorded in the clerk's office of the town where he resides.

SEC. 13. No letters of administration, or letters testamentary, shall be granted by any court of probate, upon the effects or estate of any person, until the death of such person, or the facts from which the same is presumed, shall be duly certified, as near as may be, to the town clerk, in order that the same may be duly registered according to the provisions of this chapter.

SEC. 14. The person appointed as provided in Section 1 of this chapter, shall be entitled to have the custody of all records of births, deaths or marriages of the town or city for which he is appointed, whether made under the statute now in force or any former statute, and a certificate signed by him as town or city registrar, certifying that any written or printed statement of any marriage, birth or death is a true copy of the record in his custody, shall be admitted as *prima facie* proof of such marriage, birth or death.

SEC. 15. Births, marriages and deaths, of non-residents, shall be distinguished from those of residents, in the returns by being arranged separately.

SEC. 16. The Secretary of the State Board of Health may, from time to time, vary the forms of returns, and require such additional information as he may consider necessary, to effect the object of this chapter.

SEC. 17. *Repealed January Session, 1878.*

SEC. 18. The town clerks or other officers appointed under this chapter, to collect, record and return the births in the several towns, shall receive fees therefor as follows: For collecting the facts required in relation to births, fifteen cents each; for making record and return of these facts as required by law, twenty cents each for the first fifty entries in each calendar year, and ten cents each for each subsequent entry and return.

SEC. 19. The returns required to be made by clerks of the supreme court, in relation to divorces, to the Secretary of the State Board of Health, or a prepared abstract thereof, shall be published in the annual report upon the births, marriages and deaths in the State.

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## PUBLIC LAWS, CHAPTER 680.

### AN ACT TO ESTABLISH A STATE BOARD OF HEALTH.

(As passed April, 1878, and as amended March, 1880.)

*It is enacted by the General Assembly as follows:*

SECTION 1. The Governor, with the advice and consent of the Senate, shall appoint six persons, two from the county of Providence, and one from each of the other counties, who shall constitute the State Board of Health. Of the persons so appointed, at least three shall be well educated physicians and members of some medical society incorporated by this State. The Governor may remove any member for cause, at any time, upon the written request of two-thirds of the board.

SEC. 2. The six persons first appointed shall be appointed for one, two, three, four, five and six years respectively, and hereafter, the Governor, with the advice and consent of the Senate, shall appoint one member of the board annually, for the term of six years from the first day of July. Any appointment to fill a vacancy shall be for the remainder of the term.

SEC. 3. The board shall take cognizance of the interests of life and health among the citizens of the State; they shall make investigations into the causes of

disease, and especially of epidemics and endemics among the people, the sources of mortality, and the effects of localities, employments, conditions and circumstances on the public health, and shall faithfully do all in their power to ascertain the causes and the best means for the prevention of diseases of every kind in the State. They shall publish and circulate, from time to time, such information as they may deem to be important and useful for diffusion among the people of the State, and shall investigate and give advice in relation to such subjects relating to the public health, as may be referred to them by the General Assembly, or by the Governor when the General Assembly is not in session.

SEC. 4. The State Board of Health shall also investigate the subject of diseases among cattle or other animals, and perform all the duties which have been delegated to the Board of Cattle Commissioners, in chapter 76, of the General Statutes of the State.

SEC. 5. Section 3, of chapter 76, of the General Statutes, is hereby repealed, and the Board of Cattle Commissioners, heretofore constituted under authority of said section, is hereby abolished.

SEC. 6. In every section of chapter 76, of the General Statutes, where the word "commissioners" occur, it shall be construed to mean State Board of Health.

SEC. 7. The State Board of Health shall receive the returns of births, marriages, deaths and divorces, and shall prepare the annual report upon the registration of the same as now required by law; but after the report is prepared, the returns shall be deposited in the office of the Secretary of State, to be bound and indexed by him as heretofore.

SEC. 8. Wherever the words "Secretary of State" occur in sections 1, 2, 3, 16 and 19, of chapter 77, of the General Statutes, they shall be construed to mean Secretary of the State Board of Health, and in the sixth line of section 2, of said chapter, the word "he" shall be construed to mean Secretary of State. Section 17, of chapter 77, of the General Statutes, is hereby repealed.

SEC. 9. The board shall meet in the city of Providence once in three months, and as much oftener as they may deem necessary. No member of the board, except the secretary, shall receive any compensation for his services; but the actual personal expenses of any member, while engaged in the duties of the board, shall be paid by the State.

SEC. 10. The board shall elect a well qualified physician as their secretary, who shall be *ex-officio* a member of the Board, the Commissioner of Public Health and State Registrar of Vital Statistics; but shall not thereby vote on any question upon which he is personally interested or be entitled to any additional compensation for mileage or expenses.

SEC. 11. The secretary of the said board shall make inquiry, from time to time, of the clerks of town and local boards of health, in relation to the prevalence of any disease, or any knowledge of any known or generally believed source of disease, or causes of general ill-health, and also in relation to the proceedings of the said boards of health, in respect to acts for the promotion and protection of the public health, and also in relation to diseases among domestic animals in their several towns and localities respectively; and the said clerks of town and local boards of health shall give such information, in reply to said inquiries, of such facts and circumstances as have come to their knowledge.



SEC. 12. The secretary shall perform and superintend the work prescribed in this law, and such other duties as the board may require, and he shall receive such salary, not in excess of twelve hundred dollars per annum, as the board may determine. He shall hold his office at the pleasure of the board, but may be removed at any regular meeting by a majority vote of the members thereof.

SEC. 13. The Governor shall provide a suitable office for the board in the city of Providence, and the actual expenses of the board and the members thereof, when certified by the chairman and approved by the Governor, shall be paid from the treasury of the State.

SEC. 14. The board shall make a report in print to the General Assembly, annually, of its proceedings during the year ending on the thirty-first day of December next preceding, with such suggestions in relation to the sanitary laws and interests of the State as they shall deem important.

SEC. 15. All acts and parts of acts inconsistent herewith are hereby repealed.

SEC. 16. The several town councils and boards of aldermen shall still be *ex-officio* Boards of Health in their respective towns, as is now by law provided. *Provided, however,* That the city council of any city may appoint a Board of Health for such city, which shall have all the powers and duties now conferred by law upon the board of aldermen as a Board of Health.

## SYNOPSIS OF THE LAW OF MARRIAGE IN RHODE ISLAND.

### TITLE XX., CHAPTER 149, GENERAL STATUTES.

(As amended January Session, 1881.)

SECTIONS 1, 2 and 3 show what kindred persons cannot marry, and declare marriages, within prohibited degrees, null and void.

SEC. 4 makes an exception in favor of Jews, within the degrees of affinity allowed by their religion.

SEC. 5 declares the marriage of persons having a husband or wife living, and of idiots or of lunatics, absolutely void.

SEC. 6. Prohibiting intermarriage of white and colored. Repealed January Session, 1881.

SEC. 7. "Any ordained minister or elder of any religious denomination, or minister of any society professing to meet for religious purposes and incorporated and sustaining a minister publicly ordained, and holding stated and regular services, who shall be *domiciled* in this State, and either Justice of the Supreme Court, may join persons in marriage in any town of the State." It will be seen that clergymen from other States *cannot solemnize marriages* in Rhode Island. Marriages solemnized in Rhode Island by clergyman living out of the State, are null and void.

SEC. 8. "Wardens in the town of New Shoreham may join persons in marriage in said town.

SEC. 9 provides that no minister, elder or magistrate shall join any person in marriage, unless such persons shall, if residents of this State previous thereto, obtain from the clerk of the town or city, in which such persons shall reside, or from the registrar of births, marriages and deaths of the city of Providence, if they shall reside therein, and if not residents of this State, from the town or city clerk or registrar of the town or city in which the marriage shall be solemnized, and shall deliver to such minister, elder or magistrate a certificate, properly signed, witnessed and certified by such clerk or registrar, setting forth the names and surnames of the parties, the age, color, occupation, birth-place and residence of each, whether either or both have been before married, and if before married, whether the marriage intended to be the first, second, third or other marriage, and also whether the condition of either or both persons previously married is that of a divorced persons, or of a widower or widow, as the case may be, and the names, occupation and birth-place of each of their parents; and no town or city clerk or registrar of births, marriages and deaths in the city of Providence shall issue


such certificate to any minor or person under guardianship, unless the consent in writing of the parents or guardian shall have been first obtained.

SEC. 10 forbids marriages when lawful objection is made in writing until such lawful objection is removed.

SECS. 11, 12 and 13 state the penalty for marrying persons who are already married; and the penalty for being married contrary to the provisions of the law; that is, imprisonment not exceeding six months, or a fine not exceeding one thousand dollars.

SEC. 14. "The solemnization of marriage shall be in the presence of two witnesses at least, besides the minister, elder or magistrate officiating."

SECS. 15 and 16 relate to marriages among Quakers or Friend, and among Jews, making them valid if in accordance with the forms, rites and ceremonies of the same, respectively.

 The attention of clergymen is especially called to this synopsis of the Marriage Law. Some of the provisions are not unfrequently violated. The Registration Law of Rhode Island requires clergymen to make returns of all marriages to the Town Clerk or Registrar of the town, on or before the second Monday of the month succeeding the date of the marriage.

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FOURTH ANNUAL REPORT  
OF THE  
STATE BOARD OF HEALTH,  
OF THE  
STATE OF RHODE ISLAND,

FOR THE

---

*Compliments of*  
*Chas. H. Fisher, M. D.*  
*Sec. of the State Board of Health and State Registrar*  
*of Vital Statistics,*  
*17 College St. Providence, R. I.*  
*Please acknowledge receipt.*



PROVIDENCE:  
E. L. FREEMAN & CO., PRINTERS TO THE STATE.  
1882.

MEMBERS  
OF THE  
RHODE ISLAND STATE BOARD OF HEALTH.  
DECEMBER 31, 1881.

---

DAVID KING, M. D., <i>Chairman</i> .....	NEWPORT COUNTY.
DAVID SMITH ..	WASHINGTON COUNTY.
ALBERT G. SPRAGUE, M. D. ....	KENT COUNTY.
GEORGE W. JENCKES, M. D. ....	PROVIDENCE COUNTY.
THOMAS H. SHIPMAN, M. D. ..	BRISTOL COUNTY.
CHARLES H. FISHER, M. D., <i>ex-officio</i> , and <i>Secretary</i> .....	PROVIDENCE COUNTY.

*To the Honorable General Assembly of the State of Rhode Island.*

Herewith is respectfully presented the Fourth Annual Report of the State Board of Health, in compliance with sec. 9, chapter 83, of the Public Statutes.

The Report is for the year ending December 31st, 1881, and presents a part of the general proceedings of the Board and of the work performed under its supervision; and is wholly included in the report of the Secretary, which will be found in the following pages and is respectfully submitted.

CHAS. H. FISHER, Sec.

HENRY E. TURNER, Chairman.

*May 3d, 1882.*

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## REPORT OF THE SECRETARY.

*To the Honorable the General Assembly and the members of the State Board of Health :*

The Secretary of the Board herewith respectfully submits his Fourth Annual Report.

The Report is designed to present an account of the general proceedings of the Board, and the work of the Secretary for the year ending December 31, 1881.

In regard to the general condition of the public health, during the year, it may be said that there was no great departure from the circumstances that usually prevail. In localities of somewhat limited extent, special forms of disease occurred and prevailed more or less largely, and to a greater or less degree of fatality, varying with the form of disease and place of occurrence.

The most remarkable of the special forms of disease, whether usual or unusual, that occurred during the year, were those presenting the distinctive characteristics of Malarial Fever. The prevalence was unprecedented in the history of the State. Following the sudden advent and almost universal prevalence over a small territory in Barrington in 1880, it reappeared in the same town in 1881 with but little lessened virulence and with larger distribution; and in South Providence, where it had prevailed to a small, but gradually increasing extent for two or three years previous, it reappeared in 1881 with greatly increased and alarming prevalence. In several sections of the State it was also quite prominent during the year 1881, as one of the most prevalent forms of disease, and not less than eighteen towns reported its presence to a greater or less extent.

On another page will be found a paper by Dr. C. V. Chapin, giving a more extended account of the appearance and prevalence of the Malaria in Rhode Island, and in the tables summarizing the Monthly Reports, will be found the comparative prevalence in the different towns.

Diphtheria, which had largely diminished in the number and fatality of cases in Providence city during 1879 and 1880, was more prev-



alent in that city during 1881, but not to the extent of an epidemic, nor was there any report of epidemic prevalence in any town in the State except in the town of Hopkinton.

Scarlet Fever also, although appearing in varying proportional numbers in nearly all the towns in the State, did not attain to epidemic prevalence, except in limited areas and for short periods of time.

Most of the less fatal forms of contagious and infectious diseases, appeared in many of the different towns during some part of the year, and in some localities prevailed as epidemics. Reference to the tables of monthly reports, and annual reports of medical correspondents, may be had for a more particular account of the places and times of prevalence of the various diseases.

#### MEETINGS OF THE BOARD.

The usual quarterly meetings with adjournments, and one special meeting were held during the year. At these meetings various sanitary questions appertaining to the preservation of health and the prevention of disease, were topics of discussion, and many items of knowledge and fact, ascertained by the observation and experience of the members were contributed.

At a meeting of the Board held April 7th, 1881, the sanitary condition of Newport was one of the subjects of discussion occasioned more particularly by a communication from the Secretary of the Sanitary Protection Association of that city addressed to the Chairman of the State Board of Health.

It was therein charged that the legal Board of Health of Newport (the Mayor and Board of Aldermen,) did not take sufficient notice of the presence of certain contagious diseases in that city, in that measures for the restriction and prevention of the same were neglected, and also that well known nuisances were allowed to remain unabated.

His Honor S. P. Slocum, Mayor of Newport, appeared in rebuttal of the charges.

From the statements of the Mayor, and the written testimony of a number of the leading physicians of Newport, it did not appear to the Board that the charges in regard to the large prevalence of diphtheria and scarlet fever were sustained, but it was virtually admitted that *legal measures* for the restriction of the same had been quite limited.

It was also admitted that there were some unsanitary conditions in localities mentioned, such as could be found in every city, and assurance was given that such unsanitary localities and conditions would have attention, and be remedied as soon as proper municipal legislation could be secured.

At the same meeting the following communication from Dr. O. C. Wiggin, a former member of the Board, was presented:

PROVIDENCE, Jan, 26th, 1881.

*To the Members of the State Board of Health:*

GENTLEMEN:—I have this day resigned my position as a member of your Board. I have felt impelled to this action on the ground that neither my time nor my health are adequate, in justice to the demands of this important office. My connection with the Board as a corporate body and with each of its individual members has always been a pleasant one, and the subjects which you are expected to investigate have ever been of the most lively interest to me, but the little time I have had to devote to them has made the office one of constant regret to me. I take my leave of you, gentlemen, with feelings of the utmost respect.

Very truly yours,

OLIVER C. WIGGIN.

The resignation was received and placed on file, and, upon motion of the Secretary, the following resolution was passed unanimously:

*Resolved*, That the State Board of Health receive with sincere regret the notice of the resignation of Dr. O. C. Wiggin of membership on this Board; and the members of the Board, as an associate body and individually, hereby testify to his manifest interest in all sanitary work, and his uniform urbanity and courtesy on all occasions to each and all of them.

The topic of pollution of rivers, introduced by the secretary, was also considered at considerable length at this meeting.

At the quarterly and also the annual meeting, held July 6th, after the usual routine business, and report of the Secretary in relation to reports of nuisances, visits to towns, investigation of sales of immature veal, and contagious and other diseases among domestic animals, the following were continued the officers of the Board for the ensuing year, viz:

Chairman, DAVID KING, M. D. .... Newport.

Secretary, CHAS. H. FISHER, M. D. .... North Scituate.

Auditor, DAVID KING, M. D. .... Newport.

At this meeting the Secretary reported in full an account of a meeting of the Council of the Newport Sanitary Protection Association in May, which he attended upon invitation on his private responsibility in part; and also an account of various unsanitary localities and premises pointed out to him by a committee of the council of that association, and of his conference and correspondence with parties in authority in Newport city, in relation to the same.

This report was considered at considerable length, King introduced the following resolution which was unanimously:

*Resolved*, That the State Board of Health recommend to the Honorable Mayor and Board of Aldermen of the city of Newport, the appointment of a Special Commission of Health, consisting of the Mayor and two others, one of whom shall be a competent physician, and the other a competent engineer.

"Of this Health Commission appointed by the Board of Aldermen, the Mayor shall be the Chairman."

At the same meeting there were presented copies of the new blanks devised and distributed to all the town and city clerks and city registrars, required in compliance with the amended and additional laws in relation to marriage, (sample copies of which may be found on pages 157-160,) the circular to clergymen and town clerks in relation to the same, (see page 160,) and the following circular in relation to compliance with the Public Statutes, of protection from small-pox by public vaccination.

## (CIRCULAR J.)

### OFFICE OF THE STATE BOARD OF HEALTH,

PROVIDENCE, April 13, 1881.

#### *To the Town Councils or Local Boards of Health:*

The State of Rhode Island is now, and happily has been for many years, exempt from any widely spread prevalence of SMALL POX.

Until within a few years, there was a period of time of considerable length, during which free vaccination was frequently provided by the authorities of the different towns, for all persons who would avail themselves of the protection against small pox thus gratuitously offered; and the freedom from this dire scourge of humanity in this State during a long period in the recent past, has been due to the protection thus provided.

There come now to the Secretary of the Board, complaints from many of the towns, that the law, (as provided in Chapter 74 of the General Statutes, and in Sections 24, 25 and 26 of the said chapter,) is not, and has not been for several years complied with by the proper authorities of the towns.

In one town no free vaccination has been provided in nine years. In this way the State will soon afford a free and inviting field for the introduction and dissemination of small pox with all its destructive results.

The disease is now prevalent in several of the larger cities, and quite largely in two, with which the towns of Rhode Island are in constant intercourse and communication by persons and merchandise.

The need of attention therefore to the matter of public protection from an invasion of small pox, will not fail to be perceived by the authorities of the different towns.

It should be remembered that one vaccination, (even if properly performed, and the vaccine disease runs through all the natural stages, to the production of the pitted scar,) does not always furnish complete protection, and therefore *re-vaccination* should always be performed until no characteristic vaccine pustule is produced.

The plan of appointing some place and hour for the assembling of persons desiring vaccination, is by no means effectual in securing protection to the largest number;—because of the inconvenience of attending,—the absence of a realization of the benefit to be desired,—and the natural recklessness and indifference of many.

Visitation from house to house by the vaccinator, secures the best results.

The fear that some constitutional disease may be produced by transmission from one person to another, through the vaccine virus, humanized as so called, by being carried through successive vaccinations of persons for long periods of time, (and it is extremely doubtful that such events have ever occurred from virus properly taken,) may be entirely obviated by vaccinating with bovine virus, or that taken directly from the heifer.

Virus of either kind of warranted quality, can be readily procured in this city.

Respectfully,

CHAS. H. FISHER, SEC.

At an adjourned quarterly meeting held October 19, the extraordinary prevalence of Malaria, in different parts of the State, was the principal topic of discussion. The Secretary reported visits and examinations of the malarial territory around Mashapaug and Spectacle ponds. Beside the ponds and around them at variable distances, were smaller ponds or pools, and swampy or marshy grounds which during periods of heavy rains were more or less covered or saturated with water, and which supported during the summer months a heavy growth of coarse varieties of aquatic plants and grasses. There was no noticeable decomposition of vegetable growths or decay of the same from lack of sustenance. The conditions were the same as had existed for a long period of time. It seemed evident that either some long dormant or else imported germ, having organic characteristics, had found there at the present time congenial soil and conditions for rapid development and growth. Presumed to be organic because incapable of existence under a temperature of 32 to 30 degrees Fahrenheit. Even if the malarial poison be inorganic, and of gaseous tenuity and consistence, it must be evolved from organic structures or material, in which the process of gaseous evolution is arrested, at the frost point of atmospheric temperature.

The various surmises as to the cause of the Malaria, popular among the people inhabiting this district, were related. It did not appear

that they had any foundation in fact. The report in circulation that the Secretary had ordered the water to be drawn off from Mashapaug, had just come to his knowledge and was entirely false. He did not know who had the authority to do that work, nor had he made any remark bearing such construction, as it was entirely opposed to his convictions. It was possible that there had been a misapprehension of the remark made to several persons, that if the pond had been drawn down to the lowest point at the close of winter, and kept down through the season, there would probably have been less sickness from Malaria. And that statement was all he could suggest as a possible relief for the future.

At this meeting the question of the safety of public houses in case of fire was also considered. It seemed desirable that an examination should be made of all the hotels and public houses of above two stories in height, especially the lighter and more inflammable structures at the summer resorts in the State, in regard to means of egress from each in case of fire. The means of supply of pure water, and modes and efficiency of removal of excremental and other refuse matter from the same premises was also discussed, but no action was taken.

At a special meeting held December 28th, a general review was given of the work of the closing year in the different departments of labor, and a final rendering of bills and closing of financial accounts.

## BOOK EXCHANGES, 1881.

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1 vol. cloth,	Seventh Annual Report of the State Board of Health, Michigan.....	
1 " paper,	Second Annual Report State Board of Health, Kentucky...	
2 " cloth,	38th and 39th Registration Reports of Massachusetts, for years.....	1879-1880
1 " paper,	Rocky Mountain Health Resorts, by Charles Dennison, M. D., Colorado.....	
1 " " "	3rd Annual Report of Board of Health, of Augusta, Ga.	1880
1 " " "	Annual Report, Health Officer, Burlington, Vt.....	1880
1 " " "	Annual Reports, State Board of Health, Colorado.....	1879-1880
1 " cloth,	First Biennial Report of State Board of Health, North Carolina.....	1879-1880
1 " paper,	Fifth Annual Report of Board of Health, Utica, N. Y....	1880
1 " " "	Eighth " " " Board of Health, Reading, Pa...	1880
4 " " "	Circulars 1, 2, 3 and 4 from Surgeon General's Office, U. S. A., Washington, D. C.....	1868-1875
1 " " "	Second Annual Report of State Board of Health, Lunacy and Charity, Massachusetts.....	1880
1 " " "	Twelfth Annual Report, State Board of Charities and Corrections, Rhode Island.....	1880
1 " cloth,	Rhode Island Manual, from Secretary of State.....	1881
1 " " "	Annual Report, Health Officer, District of Columbia.....	1880
7 " paper,	Third Annual Report, State Board of Health, of Connecticut.....	1880
1 " " "	Eighth Annual Report, City Health Officer, New Haven, Conn.....	1880
1 " " "	Fourth Annual Report of the State Board of Health, New Jersey.....	1880
1 " " "	Annual Report of City Health Officer of Chicago, Ill....	1880
1 " " "	Annual Report of Surgeon Gen. of the Marine Hospital Service, U. S.....	1880
1 " cloth,	Trichinæ and Trichinosis from the Agricultural Department, D. C.....	1881
1 " paper,	Fifth Annual Report of the State Board of Health of Wisconsin.....	1880
1 " cloth,	Annual Report of the State Board of Health, Alabama....	1880
1 " " "	First Annual Report of the State Board of Health, Tennessee.....	1877-1880
1 " paper,	First Annual Report of the State Board of Health of New York.....	1880
1 " " "	Third Annual Report of the State Board of Health of Kentucky.....	1880
1 " cloth,	Annual Report City Board of Health, Philadelphia, Penn.	1880

1 vol. cloth, Supplement, Second Annual Report of the State Board of Health of Massachusetts .....	1880
1 " paper, Transactions of the New Hampshire Medical Society, June .....	1881
1 " " Eighth Biennial Report of the Asylum for Feeble Minded, Illinois.....	1880
1 " " First Annual Report of the Sanitary Reform Society, city of New York, N. Y.....	1880
1 " " Annual Report Board of Health of Hudson County, New Jersey.....	1880
1 " cloth, Eighth Annual Report of the State Board of Health of Michigan.....	1880
1 " " Report on the Statistics of Labor, Massachusetts.....	1880
1 " " Report State Board of Education and Commissioner of Public Schools, Rhode Island.....	1880
2 " paper, From Nathan Allen, M. D., Lowell, Mass.....	
1 " " House Drainage, Wm. Paul Gerhard, Newport, R. I.....	
1 " " Annual Report of Supt. of Health, Providence, R. I.....	1880
1 " " R. I. Historical Society.....	1880
Also Health Reports of Brooklyn and Utica, N. Y., Boston, Mass., Charlestown, S. C., Saint Paul, Minn., Burlington, Vt., Chicago, Ill., Dayton, Ohio, Lansing, Mich., San Francisco, Cal., Baltimore, Ind., etc., etc. Also Periodicals, New England Medical Monthly, The Sanitary News, Nat. Board of Health Bulletin, etc.	

### MEDICAL CORRESPONDENTS.

1881.

Dr. M. P. Arnold,	Dr. J. H. Eldridge,	Dr. A. A. Mann,
" D. H. Batchelder,	" R. P. Eddy,	" C. E. Maryott,
" J. C. Budlong,	" D. M. Edwards,	" A. Potter,
" Otis Bullock,	" G. R. Fisher,	" F. A. Rankin,
" A. B. Briggs,	" L. F. C. Garvin,	" A. A. Saunders,
" H. J. Bruce,	" E. V. Granger,	" T. H. Shipman,
" E. G. Carpenter,	" Benj. Greene,	" A. G. Sprague,
" J. S. Chipman,	" G. B. Haines,	" W. J. Smith,
" G. L. Church,	" G. A. Harris,	" G. H. Stanley,
" E. P. Clark,	" G. W. Jenckes,	" E. P. Stimson,
" I. B. Cowen,	" A. E. Kemp,	" J. O. Whitney,
" H. C. Crandall,	" David King,	" John Winsor,
	" D. O. King,	

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REPORT ON THE REGISTRATION  
OF  
BIRTHS, MARRIAGES AND DEATHS,  
IN THE  
STATE OF RHODE ISLAND,  
FOR THE  
YEAR ENDING DECEMBER 31, 1880.  
ALSO  
COMMENTS UPON AND COMPARISONS OF THE SAME EVENTS FOR  
VARIOUS PERIODS FROM 1852 TO 1880.

BY CHARLES H. FISHER, M. D.

STATE REGISTRAR OF VITAL STATISTICS.

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TOWNS AND DIVISIONS OF THE STATE.	BIRTHS, 1880.						MARRIAGES, 1880.						DEATHS, 1880.											
	SEX.			PARENTAGE.			NATIVITY.			SEX.			PARENTAGE.			AGES GIVEN.			AGGREGATE AGE IN YEARS.			AVERAGE AGE IN YEARS.		
	Whole Number.		Females.	American.		Foreign.	American.		Foreign.	Males.		Females.	American.		Foreign.	Males.		Females.	Males.		Females.	Aggregate Age in years.		Average Age in years.
	Male.	Female.		Male.	Female.		Male.	Female.		Male.	Female.		Male.	Female.		Male.	Female.		Male.	Female.		Male.	Female.	
Barrillville.....	5,714	60	56	46	54	7	18	22	10	3	103	49	56	53	49	56	1,193	1,603	24.14	28.83	2,796	38.57		
Cranston.....	2,342	120	64	56	68	9	12	23	13	4	166	84	82	69	77	83	2,043	2,777	34.40	28.51	5,180	38.34		
Cumberland.....	6,082	143	72	70	81	9	11	24	23	6	177	90	87	37	40	41	1,478	1,253	34.60	28.51	2,711	38.34		
East Providence.....	1,582	124	66	50	44	9	12	20	20	0	77	41	36	32	35	41	1,275	1,013	18.00	21.84	1,533	24.88		
Greene.....	1,582	22	14	22	34	6	12	20	20	0	77	41	36	32	35	41	1,275	1,013	18.00	21.84	1,533	24.88		
Grochester.....	2,200	22	99	17	30	26	10	20	13	3	42	23	17	33	13	23	1,043	1,013	30.72	43.35	1,946	59.84		
Marblehead.....	5,795	146	81	85	67	18	16	31	19	2	42	23	17	33	13	23	1,043	1,013	30.72	43.35	1,946	59.84		
North Providence.....	13,755	290	153	146	67	18	16	31	19	2	42	23	17	33	13	23	1,043	1,013	30.72	43.35	1,946	59.84		
North Smithfield.....	1,467	29	11	10	13	12	8	1	16	5	11	10	6	5	11	10	1,151	1,013	26.30	32.77	3,648	20.47		
Pawtucket.....	8,088	211	101	102	149	164	39	52	4	3	351	175	173	143	206	174	8,821	5,172	37.30	41.80	1,394	30.91		
Smithfield.....	3,810	78	43	35	61	9	4	21	9	1	58	30	28	51	7	80	5,172	3,730	38.73	44.88	9,986	38.41		
South Smithfield.....	8,985	58	31	25	24	27	3	2	18	0	33	18	15	26	5	18	1,462	1,082	38.80	42.19	2,430	41.73		
Woonsocket.....	16,080	371	182	189	60	273	16	22	187	94	70	12	11	318	152	166	2,484	3,113	15.45	18.64	741	22.45		
TOWNS, PROV. CO.....	93,017	1,984	1,004	980	726	956	118	184	784	448	206	59	71	1,588	805	783	700	888	30,385	23,017	25.38	28.18	42,402	37.40
PROVIDENCE CITY.....	104,857	2,626	1,361	1,265	1,055	1,088	199	284	1,231	760	246	91	134	2,040	968	1,062	930	1,160	38,446	33,949	26.72	30.45	61,997	39.67
Charlestown.....	1,117	13	7	6	10	1	1	2	13	13	1	1	1	15	10	5	445	373	44.50	39.30	642	42.60		
Exeter.....	1,310	30	13	17	27	1	1	2	13	13	1	1	1	35	10	10	354	197	33.40	37.30	707	35.35		
Hopkinton.....	2,962	62	32	30	48	3	3	8	60	56	1	1	1	67	30	37	1,196	1,201	39.77	48.55	1,026	47.82		
North Kingstown.....	3,949	90	44	46	72	11	5	2	35	34	1	1	1	67	30	37	1,196	1,201	39.77	48.55	1,026	47.82		
North Kingstown.....	5,114	88	41	47	77	4	3	4	36	36	1	5	4	67	30	37	1,196	1,201	39.77	48.55	1,026	47.82		
Richmond.....	1,949	41	22	19	31	7	3	8	3	3	33	17	16	29	4	27	1,155	999	32.50	51.61	2,064	53.10		
Westerly.....	6,104	104	50	54	45	47	5	7	85	75	2	5	3	77	36	41	913	1,120	36.08	26.66	1,296	37.45		
WASHINGTON CO.....	22,495	428	209	219	310	74	16	28	246	280	8	13	10	286	139	147	5,256	5,566	37.83	37.83	10,815	37.82		
COUNTIES.																								
Bristol.....	11,394	278	150	128	146	106	15	11	97	65	22	7	8	219	104	115	3,386	4,570	22.70	40.00	7,906	38.45		
Kent.....	30,588	440	231	219	226	160	22	32	217	140	50	15	12	306	150	156	255	51	149	155	5,466	6,533	36.70	46.00
Newport.....	94,190	539	286	253	278	171	47	43	194	142	21	17	14	850	190	170	257	98	179	170	7,001	7,839	36.16	46.00
Providence.....	197,874	4,610	2,305	2,245	1,781	2,044	317	468	2,015	1,206	452	150	205	3,668	1,738	1,875	1,630	2,048	1,791	1,873	48,883	55,366	37.36	29.50
Washington.....	22,495	428	209	219	310	74	16	28	246	280	8	13	10	286	139	147	5,256	5,566	37.83	37.83	10,815	37.82		
Whole State.....	276,531	6,295	3,241	3,054	2,741	2,555	417	582	2,769	1,775	548	202	244	4,829	2,266	2,463	2,517	2,312	2,360	2,460	59,895	78,877	29.93	32.06

TABLE II.—BIRTHS, 1880.

*Arranged by Months, Sexes, and Divisions of the State.*

MONTHS.	SEX.	DIVISIONS OF THE STATE.							
		Whole State.	Bristol County.	Kent County.	Newport County, Towns.	Newport City.	Providence County, Towns.	Providence City.	Washington County.
January....	Males....	276	19	14	11	15	85	103	29
	Females..	238	12	13	5	14	68	110	16
	Total....	514	31	27	16	29	153	213	45
February...	Males....	250	14	23	6	11	71	98	27
	Females..	244	14	12	3	15	81	98	21
	Total....	494	28	35	9	26	152	196	48
March.....	Males....	270	18	12	4	15	79	130	12
	Females..	247	15	23	1	13	74	101	20
	Total....	517	33	35	5	28	153	231	32
April.....	Males....	209	9	18	6	16	59	91	10
	Females..	231	10	14	9	12	78	94	14
	Total....	440	19	32	15	28	137	185	24
May.....	Males....	255	15	15	5	21	89	94	16
	Females..	277	6	20	4	16	96	114	21
	Total....	532	21	35	9	37	185	208	37
June.....	Males....	271	12	22	4	15	76	127	15
	Females..	240	7	17	3	12	71	114	16
	Total....	511	19	39	7	27	147	241	31
July.....	Males....	266	11	19	5	13	75	128	15
	Females..	265	8	18	11	18	78	108	24
	Total....	531	19	37	16	31	153	236	39

TABLE II.—BIRTHS, 1880.—Continued.

MONTHS.	SEX.	DIVISIONS OF THE STATE.							
		Whole State.	Bristol County.	Kent County.	Newport County, Towns.	Newport City.	Providence County, Towns.	Providence City.	Washington County.
August.....	Males....	292	6	21	5	16	96	128	20
	Females..	252	10	22	6	16	84	90	24
	Total....	544	16	43	11	32	180	218	44
September..	Males....	279	8	22	7	20	103	107	12
	Females..	282	9	26	3	20	101	110	13
	Total....	561	17	48	10	40	204	217	25
October ....	Males....	296	14	21	10	18	94	122	17
	Females..	258	19	14	5	13	92	98	17
	Total....	554	33	35	15	31	186	220	34
November..	Males....	272	12	19	8	18	83	113	19
	Females..	249	6	13	2	19	69	120	20
	Total....	521	18	32	10	37	152	233	39
December ..	Males....	308	12	25	10	27	97	120	17
	Females..	268	12	17	7	26	85	108	13
	Total....	576	24	42	17	53	182	228	30
Whole year.	Males....	3,244	150	231	81	205	1,004	1,361	209
	Females..	3,051	128	209	59	194	980	1,265	219
	Total....	6,295	278	440	140	399	1,984	2,626	428

TABLE III.—PLURALITY BIRTHS, 1880.

ARRANGED BY MONTHS AND DIVISIONS OF THE STATE, AND SHOWING THE NATIVITY OF THE PARENTS.

MONTHS.	SEX.		DIVISIONS OF THE STATE.						NATIVITY OF THE PARENTS.												
	Number of Cases.	No. of Children.	Bristol County.	Newport Co., Towns.	Newport City.	Providence Co., Towns.	Providence City.	Washington Co.	American.	Irish.	English.	German.	Portuguese.	American father.	Scotch mother.	American father.	Eng. mother.	English father.	Am. mother.	English father.	Irish mother.
January.....	5	Males..... 4 Females..... 6	1	1	1	1	3	...	2	3	...	...	...	...	...	...	...	...	...	...	...
February.....	4	Males..... 2 Females..... 6	...	1	1	1	1	...	2	2	...	...	...	...	...	...	...	...	...	...	...
March.....	5	Males..... 8 Females..... 2	...	...	...	2	3	...	1	2	1	...	...	...	...	...	...	...	1	...	...
April.....	3	Males..... 4 Females..... 2	...	...	...	1	2	...	1	2	...	...	...	...	...	...	...	...	...	...	...
May.....	6	Males..... 10 Females..... 2	...	...	2	3	1	...	3	2	...	...	...	...	...	...	...	...	...	...	1
June.....	5	Males..... 5 Females..... 5	1	...	...	...	4	...	1	2	1	...	...	...	...	...	1	...	...	...	...
July.....	5	Males..... 8 Females..... 2	...	...	1	1	3	...	1	1	1	1	...	...	...	...	...	...	...	...	...
August.....	5	Males..... 4 Females..... 6	...	1	...	2	1	1	3	1	...	...	...	1	...	...	...	...	...	...	...
September.....	5	Males..... 5 Females..... 5	...	...	...	1	4	...	2	2	...	...	1	...	...	...	...	...	...	...	...
October.....	2	Males..... 2 Females..... 2	2	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...
November.....	3	Males..... 3 Females..... 3	...	...	...	2	2	...	...	1	1	...	1	...	...	...	...	...	...	...	...
December.....	5	Males..... 6 Females..... 4	...	2	2	1	1	...	2	2	...	...	...	...	...	...	...	...	1	...	...
Whole Year.....	53	Males..... 55 Females..... 51	4	2	6	15	25	1	20	20	4	1	2	1	1	1	1	1	2	1	1

TABLE IV.—MARRIAGES, 1880.

*Arranged by Months and Divisions of the State.*

MONTHS.	Whole State, 1880.	DIVISIONS OF THE STATE.							Whole State, 1879.
		Bristol County.	Kent County.	Newport County, Towns.	Newport City.	Providence County, Towns.	Providence City.	Washington County.	
January.....	205	5	17	3	10	49	105	16	217
February.....	209	6	13	3	6	59	100	22	183
March.....	160	5	21	7	9	48	53	17	121
First Quarter....	574	16	51	13	25	156	258	55	521
April .....	228	8	15	10	15	66	98	16	198
May.....	243	9	22	3	10	72	109	18	205
June.....	234	11	23	6	5	61	111	17	208
Second Quarter..	705	28	60	19	30	199	318	51	611
July.....	209	7	16	4	10	58	97	17	158
August.....	166	6	15	5	12	43	75	10	187
September.....	255	7	15	4	12	75	115	27	209
Third Quarter...	630	20	46	13	34	176	287	54	554
October ....	259	12	16	6	10	79	108	28	221
November.....	344	16	34	8	16	92	148	30	292
December.. ....	257	5	10	12	8	82	112	28	197
Fourth Quarter..	860	33	60	26	34	253	368	86	710
Whole Year.....	2,769	97	217	71	123	784	1,231	246	2,396

TABLE V.—AGES OF PERSONS MARRIED, 1880.

AGES OF MEN.	AGES OF WOMEN.													Whole Number of Males.
	Under 20.	20 to 25.	25 to 30.	30 to 35.	35 to 40.	40 to 45.	45 to 50.	50 to 55.	55 to 60.	60 to 65.	65 to 70.	Not stated.		
Under 20.....	77	24	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	102	
20 to 25.....	373	597	93	11	3	.....	.....	.....	.....	.....	.....	.....	1,077	
25 to 30.....	97	414	201	45	6	1	.....	.....	.....	.....	.....	.....	764	
30 to 35.....	25	122	117	61	16	4	.....	.....	.....	.....	.....	.....	345	
35 to 40.....	10	46	52	44	32	19	2	1	.....	.....	.....	.....	206	
40 to 45.....	4	11	17	24	27	8	2	2	1	1	.....	.....	97	
45 to 50... ..	.....	4	10	12	17	6	12	2	1	.....	.....	.....	64	
50 to 55.....	.....	3	2	10	13	11	6	4	1	2	.....	.....	52	
55 to 60.....	.....	.....	3	2	5	8	1	3	2	.....	.....	.....	24	
60 to 65.....	.....	3	1	1	1	5	2	1	2	1	1	.....	18	
65 to 70.....	.....	.....	1	.....	3	2	2	1	2	1	1	.....	13	
70 to 75.....	.....	.....	.....	.....	.....	1	.....	2	.....	.....	.....	.....	3	
75 to 80.....	.....	.....	.....	1	.....	1	1	.....	.....	.....	.....	.....	3	
80 to 85.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	1	
Not stated.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Whole No. Females.....	586	1,224	498	211	123	66	27	13	9	9	2	1	2,769	

TABLE VI.—DEATHS, 1880.

*Arranged by Months, Sexes, and Divisions of the State.*

MONTHS.	SEX.	Whole State.	DIVISIONS OF THE STATE.						
			Bristol County.	Kent County.	Newport County, Towns.	Newport City.	Providence County, Towns.	Providence City.	Washington County.
January.....	Males...	199	5	8	7	14	71	83	11
	Females.	223	4	8	7	18	70	118	8
	Total....	422	9	16	14	32	141	201	19
February....	Males...	200	9	14	7	6	56	97	11
	Females.	168	2	9	5	13	45	79	15
	Total....	368	11	23	12	19	101	176	26
March .....	Males...	209	12	10	3	9	71	95	9
	Females.	217	14	8	5	11	84	88	7
	Total....	426	26	18	8	20	155	183	16
April. ....	Males...	192	5	20	3	8	60	86	10
	Females.	208	11	14	6	4	57	105	11
	Total....	400	16	34	9	12	117	191	21
May.....	Males...	175	6	7	5	12	44	89	12
	Females.	217	8	14	5	12	67	100	11
	Total....	392	14	21	10	24	111	189	23
June.....	Males...	177	4	14	3	9	68	68	11
	Females.	180	8	14	2	3	53	85	15
	Total....	357	12	28	5	12	121	153	26
July.....	Males...	233	11	13	6	14	89	90	10
	Females.	255	13	14	3	15	88	118	4
	Total....	488	24	27	9	29	177	208	14
August.....	Males...	208	14	17	1	11	77	74	14
	Females.	222	10	10	4	11	74	100	13
	Total....	430	24	27	5	22	151	174	27
September...	Males...	202	8	10	6	10	79	74	15
	Females.	186	7	13	4	14	63	69	16
	Total....	388	15	23	10	24	142	143	31
October....	Males...	205	10	13	3	12	66	84	17
	Females.	211	16	19	3	14	73	69	17
	Total....	416	26	32	6	26	139	153	34
November...	Males...	187	12	11	9	7	64	74	10
	Females.	178	14	19	....	4	57	72	12
	Total....	365	26	30	9	11	121	146	22
December...	Males...	179	8	13	5	10	60	74	9
	Females.	198	8	14	5	12	52	89	18
	Total....	377	16	27	10	22	112	163	27
Whole Year..	Males...	2,366	104	150	58	122	805	988	139
	Females.	2,463	115	156	49	121	783	1,092	147
	Total....	4,829	219	306	107	243	1,588	2,080	286



TABLE VII.—DEATHS, 1880.

*Showing the Number of each Sex, in each Period of Life, in every Town and Division of the State; also the Ratio of Deaths to Population.*

TOWNS AND DIVISIONS OF THE STATE.	POPULATION, 1880.		DEATHS, 1880.					
	Whole Number.	SEX.	Per cent. to Population.	Whole Number.	SEX.	Under 1 year.	1 and under 2.	2 and under 3.
Barrington.....	1,359	Males....	1.54	21	7	2	...	1
		Females..			14	2	1	...
Bristol.....	6,028	Males....	2.01	121	60	13	4	2
		Females..			61	10	3	1
Warren.....	4,007	Males....	1.92	77	37	10	1	2
		Females..			40	5	...	...
BRISTOL COUNTY ...	11,394	Males....	1.92	219	104	25	5	5
		Females..			115	17	4	1
Coventry.....	4,519	Males....	1.35	61	33	5	3	1
		Females..			28	3	1	...
East Greenwich.....	2,887	Males....	1.84	53	28	5	1	1
		Females..			25	2	3	...
West Greenwich....	1,018	Males....	2.26	23	9	...	1	...
		Females..			14	...	1	...
Warwick.....	12,164	Males....	1.39	169	80	17	6	5
		Females..			89	9	6	6
KENT COUNTY.....	20,588	Males....	1.49	306	150	27	11	7
		Females..			156	14	11	6
Jamestown.....	459	Males....	.44	2	1	...	...	...
		Females..			1	...	...	...
Little Compton.....	1,202	Males....	1.25	15	9	...	...	...
		Females..			6	...	...	...
Middletown.....	1,139	Males....	1.40	16	8	1	...	...
		Females..			8	1	...	...
New Shoreham.....	1,203	Males....	.49	6	2	...	...	...
		Females..			4	...	1	...
Portsmouth.....	1,979	Males....	.50	26	13	1	2	...
		Females..			13	1	...	...
Tiverton.....	2,505	Males....	1.68	42	25	7	2	...
		Females..			17	2	...	...
TOWNS, NEWPORT Co.	8,487	Males....	1.26	107	58	9	4	...
		Females..			49	4	1	...
NEWPORT CITY.....	15,693	Males....	1.54	243	122	27	5	3
		Females..			121	21	8	3

TABLE VII.—DEATHS, 1880.—Continued.

3 and under 4.	4 and under 5.	5 and under 10.	10 and under 15.	15 and under 20.	20 and under 30.	30 and under 40.	40 and under 50.	50 and under 60.	60 and under 70.	70 and under 80.	80 and under 90.	90 and over,	Not stated.
....	....	....	....	....	2	....	....	....	....	2	....	....	....
1	1	....	....	1	1	1	....	2	2	1	....	1	....
1	4	2	2	3	4	3	4	3	5	4	6	1	..
....	3	....	3	4	6	5	3	5	6	6	6	....	....
....	....	1	....	1	2	4	1	4	2	2	6	1	1
....	....	2	....	....	4	3	2	6	8	6	3	....	....
1	4	3	2	4	8	7	5	7	7	8	12	....	1
1	3	2	3	5	11	10	5	13	16	13	8	3	....
....	....	....	....	....	....	....	....	....	....	....	....	....	....
1	....	....	....	....	2	....	2	8	5	4	2	....	....
....	....	2	....	3	3	3	2	2	5	4	....	....	....
....	....	....	....	2	2	3	....	....	2	7	5	....	....
....	....	....	2	....	3	3	1	2	....	5	3	1	....
....	1	1	....	....	....	....	....	2	....	2	2	....	....
....	1	2	....	....	2	1	....	....	1	4	....	2	....
3	2	3	....	1	9	6	4	5	8	9	1	1	....
4	....	13	1	2	6	10	8	7	2	7	4	2	2
4	3	4	....	3	13	9	6	15	15	22	10	1	....
4	1	17	3	5	14	17	11	11	8	20	7	5	2
....	....	....	....	....	....	....	....	1	....	....	....	....	....
....	....	....	....	....	....	....	1	....	....	....	....	....	....
....	....	....	1	....	....	....	....	....	....	4	4	....	....
....	....	....	....	....	....	2	1	....	1	1	1	....	....
....	....	....	....	1	1	....	1	....	1	2	1	....	....
....	....	....	....	....	1	....	....	1	2	1	1	1	....
....	....	....	....	....	....	....	....	....	....	2	2	....	....
....	....	....	....	....	....	1	....	....	....	2	....	....	....
....	....	....	1	....	1	2	....	....	3	1	2	....	....
....	....	....	1	1	1	2	....	....	1	3	3	....	....
....	....	1	....	....	....	2	2	....	4	3	3	....	1
1	....	2	....	1	....	2	2	1	2	3	1	....	....
....	....	1	2	1	2	4	3	1	8	10	12	....	1
1	....	2	1	2	2	7	4	2	6	10	6	1	....
....	....	....	....	....	....	....	....	....	....	....	....	....	....
3	2	6	2	3	11	6	8	7	16	20	3	....	....
....	....	4	....	5	5	10	10	8	13	14	18	2	....

TABLE VII.—DEATHS, 1880.—Continued.

TOWNS AND DIVISIONS OF THE STATE.	POPULATION, 1880.		DEATHS, 1880.			Under 1 year.	1 and under 2.	2 and under 3.
	Whole Number.	SEX.	Per cent. to Population.	Whole Number.	Sex.			
Burrillville.....	5,714	Males....	1.84	105	49	10	4	4
		Females..			56	9	1	6
Cranston.....	5,940	Males....	2.04	146	84	7	1	2
		Females..			62	4	1	...
Cumberland.....	6,445	Males....	1.66	107	60	19	4	2
		Females..			47	12	2	2
East Providence...	5,056	Males....	1.52	77	41	13	7	2
		Females..			36	3	5	2
Foster.....	1,552	Males....	1.37	21	11	...	1	1
		Females..			10	...	...	...
Glocester.....	2,250	Males....	1.80	42	25	6	1	...
		Females..			17	2	...	...
Johnston.....	5,765	Males....	1.40	81	44	8	5	2
		Females..			37	6	4	1
Lincoln.....	13,765	Males....	1.37	188	84	24	9	6
		Females..			104	23	12	10
North Providence.	1,467	Males....	1.09	16	5	1	...	...
		Females..			11	2	...	...
North Smithfield..	3,088	Males....	1.45	45	27	4	2	2
		Females..			18	4	2	...
Pawtucket.....	19,030	Males....	1.84	351	175	34	12	7
		Females..			176	31	14	10
Scituate.....	3,810	Males....	1.52	58	30	5	...	1
		Females..			28	3	2	1
Smithfield.....	3,085	Males....	1.07	33	18	4	2	1
		Females..			15	1	1	...
Woonsocket.....	16,050	Males....	1.98	318	152	53	20	11
		Females..			166	33	21	13
TOWNS, PROV. CO.	93,017	Males....	1.70	1,588	805	188	68	41
		Females..			783	133	65	45
PROVIDENCE CITY.	104,857	Males....	1.98	2,080	988	195	66	39
		Females..			1,092	188	80	36
Charlestown.....	1,117	Males....	1.34	15	10	...	...	...
		Females..			5	...	2	...
Exeter.....	1,310	Males....	1.52	20	10	3	...	1
		Females..			10	3	...	...
Hopkinton.....	2,952	Males....	1.12	34	14	1	...	1
		Females..			20	2	...	...
North Kingstown.	3,949	Males....	1.70	67	30	3	...	2
		Females..			37	2	3	3
South Kingstown.	5,114	Males....	.78	40	22	2	...	...
		Females..			18	2	...	...
Richmond.....	1,949	Males....	1.70	33	17	5	1	1
		Females..			16	2	...	1
Westerly.....	6,104	Males....	1.26	77	36	10	2	4
		Females..			41	8	3	1
WASHINGTON CO..	22,495	Males....	1.27	286	139	24	3	9
		Females..			147	19	8	5

TABLE VII.—DEATHS, 1880.—Continued.

3 and under 4.	4 and under 5.	5 and under 10.	10 and under 15.	15 and under 20.	20 and under 30.	30 and under 40.	40 and under 50.	50 and under 60.	60 and under 70.	70 and under 80.	80 and under 90.	90 and over.	Not stated.
5	1	4	2	....	3	1	2	2	4	5	2	....	....
2	1	9	2	2	1	2	3	2	6	8	2	....	....
1	1	3	....	....	12	9	5	13	13	9	6	1	1
2	3	3	....	3	3	11	12	1	3	9	5	1	1
3	2	4	2	1	2	2	3	2	5	6	3	....	....
3	....	2	....	4	5	4	2	2	2	5	2	....	1
....	1	4	1	2	....	1	1	1	....	6	2	....	....
....	1	2	....	3	1	4	3	5	3	1	2	....	....
....	....	....	....	....	....	....	1	....	2	2	3	1	....
....	....	....	....	....	1	1	2	1	1	4	....	....	....
....	....	2	....	1	3	2	....	2	3	3	2	....	....
....	....	1	....	....	3	2	....	4	....	2	1	2	....
1	....	4	....	....	3	2	1	3	6	7	....	1	1
1	1	4	1	2	2	2	4	3	3	1	1	....	1
5	4	8	1	2	7	3	4	2	4	2	2	1	....
3	2	6	4	4	5	6	6	4	5	10	2	2	....
....	....	....	1	....	....	....	1	....	2	....	....	....	....
1	....	1	....	....	2	2	....	....	1	1	1	....	....
2	1	2	....	1	2	....	1	2	4	2	2	....	....
1	....	1	....	....	....	1	3	3	1	1	1	....	....
3	8	14	5	4	15	17	9	17	8	11	9	....	2
7	5	7	5	5	14	21	7	9	15	14	10	2	....
....	....	2	....	2	2	2	2	5	3	5	1	....	....
1	....	1	....	1	3	1	....	1	4	4	6	....	....
....	....	1	....	1	4	....	1	2	1	1	....	....	....
1	....	4	2	1	1	1	1	....	....	....	1	1	....
6	2	7	....	3	9	6	8	7	8	5	6	1	....
5	6	7	9	5	15	11	9	7	12	9	4	....	....
26	20	55	12	17	62	45	39	58	63	64	38	5	4
27	19	48	23	30	56	69	52	42	56	69	38	8	3
32	29	65	17	24	89	77	85	64	88	77	32	9	....
32	35	70	24	28	118	92	71	84	76	97	49	12	....
....	....	1	....	1	....	....	1	....	1	2	2	....	2
....	....	....	1	....	....	....	....	....	....	....	2	....	....
....	....	1	....	....	....	....	1	....	2	2	....	....	....
....	1	....	....	....	....	1	1	....	2	1	1	....	....
....	....	1	....	1	1	....	....	1	3	1	2	1	....
1	1	2	....	....	....	2	1	....	4	3	4	....	1
....	1	2	1	....	4	4	....	2	6	....	5	....	....
1	2	3	....	1	4	4	2	2	....	5	4	1	....
....	....	....	1	2	....	1	1	4	4	4	4	1	2
....	....	....	1	....	....	1	2	2	1	4	4	....	1
....	....	1	....	....	1	....	....	....	2	4	1	....	1
....	1	....	....	....	4	....	1	....	2	2	3	....	....
1	2	3	1	....	1	1	2	....	2	1	5	1	....
1	....	6	2	....	3	2	3	1	3	2	4	....	....
1	3	9	4	3	9	5	5	4	20	14	19	3	....
3	5	11	4	3	11	10	10	5	12	17	22	1	....

TABLE VII—DEATHS, 1880.—RECAPITULATION BY COUNTIES.

COUNTIES.	POPULATION, 1880.			DEATHS, 1880.					
	Whole Number.	SEX.		Per cent to Population.	Whole Number.	Sex.	Under 1 year.	1 and under 2.	2 and under 3.
BRISTOL Co. . . .	11,394	Males. . .	5,438	1.92	219	104	25	5	5
		Females.	5,956			115	17	4	1
KENT Co. . . . .	20,588	Males. . .	10,021	1.49	306	150	27	11	7
		Females.	10,567			156	14	11	6
NEWPORT Co. . .	24,180	Males. . .	11,574	1.45	350	180	36	9	3
		Females.	12,606			170	25	9	3
PROV. Co. . . . .	197,874	Males. . .	94,921	1.85	3,668	1,793	383	134	80
		Females.	102,953			1,875	321	145	81
WASH. Co. . . . .	22,495	Males. . .	11,076	1.27	286	139	24	3	9
		Females.	11,419			147	19	8	5
WHOLE STATE.	276,531	Males. . .	133,030	1.75	4,829	2,366	495	162	104
		Females.	143,501			2,463	396	177	96

TABLE VII.—DEATHS, 1880.—RECAPITULATION BY COUNTIES.

3 and under 4.	4 and under 5.	5 and under 10.	10 and under 15.	15 and under 20.	20 and under 30.	30 and under 40.	40 and under 50.	50 and under 60.	60 and under 70.	70 and under 80.	80 and under 90.	90 and over.	Not stated.
1	4	3	2	4	8	7	5	7	7	8	12	....	1
1	3	2	3	5	11	10	5	13	16	13	8	3	....
4	3	4	....	3	13	9	6	15	15	22	10	1	....
4	1	17	3	5	14	17	11	11	8	20	7	5	2
3	2	7	4	4	13	10	11	8	24	30	15	....	1
1	...	6	1	7	7	17	14	10	19	24	24	3	....
58	49	120	29	41	151	122	124	122	151	141	70	14	4
59	54	118	47	58	174	161	123	126	132	166	87	20	3
1	3	9	4	3	9	5	5	4	20	14	19	3	4
3	5	11	3	3	11	10	10	5	12	17	22	1	2
67	61	143	39	55	194	153	151	156	217	215	126	18	10
68	63	154	57	78	217	215	163	165	187	240	148	32	7

TABLE VIII.—CAUSES OF DEATH, 1880.

Arranged Alphabetically; showing the Number of each Sex, who died from each cause, in each Month and in the whole year 1880; also the Number of American and of Foreign Parentage, from each cause, for the year.

CAUSES OF DEATH.	PARENTAGE.		Jan. Feb. Mar. April. May. June. July. Aug. Sept. Oct. Nov. Dec.												SEX.											
	Am.	For. Total.	M. F.		M. F.		M. F.		M. F.		M. F.		M. F.		M. F.		M.	F.	Total.							
			M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.										
Accidents (various).....	16	30	46	5	1	2	2	2	3	1	4	3	2	4	2	5	1	1	3	2	2	1	34	12	46	
“ Burns and Scalds.....	7	14	21	1	1	1	1	1	1	2	1	1	2	1	1	2	1	1	1	1	1	2	12	9	21	
“ Drowning.....	15	18	33	4	4	2	1	1	4	3	2	1	4	1	1	2	3	3	3	3	3	2	27	6	33	
“ Falls.....	6	8	14	2	1	1	1	1	1	1	1	1	1	1	2	1	2	1	1	1	1	10	4	14		
“ Poisoning.....	1	4	5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	2	5		
“ Railroad.....	7	11	18	1	1	1	1	1	1	1	3	2	2	2	2	2	1	1	2	1	1	15	3	18		
Abscesses.....	4	1	5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	5		
Aneurism.....	2	2	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	7	
Anæmia.....	5	2	7	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	7	7	
Apoplexy.....	87	32	119	5	6	3	3	5	6	2	6	5	5	3	2	4	3	11	9	10	6	5	59	60	119	
Asthma.....	6	5	11	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	7	11	11	
Bladder, Disease of.....	5	4	9	2	1	1	1	1	1	1	2	1	2	1	2	1	1	1	2	1	1	1	9	9	9	
Bones, Disease of.....	5	1	6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	5	1	6	6	
Bowels, Disease of.....	4	5	9	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	7	2	9	9	
Brain, Disease of.....	28	21	49	4	4	3	2	2	1	2	1	3	1	3	2	2	2	2	3	1	1	2	26	24	49	
“ Congestion of.....	16	8	24	1	1	4	3	3	3	2	1	1	2	2	2	2	2	3	1	1	2	4	26	24	49	
“ Inflammation of.....	43	45	88	11	7	5	1	2	3	4	3	6	4	4	2	5	4	2	3	3	2	3	13	11	24	
Bronchitis.....	44	47	91	2	1	6	5	6	8	11	4	4	5	1	2	2	3	5	1	3	2	1	49	39	88	
Cancer (various).....	49	29	78	2	2	1	1	2	3	3	2	9	2	3	2	1	4	5	5	3	2	6	4	37	41	78
“ of Breast.....	4	4	8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	8	8	
“ of Stomach.....	10	8	18	2	1	1	1	1	1	1	1	3	1	1	1	3	1	1	1	1	1	2	8	10	18	

CAUSES OF DEATH.		PARENTAGE.												SEX.											
		Am.	For.	Total.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	M.	F.	M.	F.	M.	F.	M.	F.	Total.
Cancer of Uterus.....	10	11	21		5	1		1	1	5			4			2	1	1	...	1	...	21		21	
Cancerum Oris.....	2	...	2			1				1									1	1	...	1		2	
Catarrh.....	1	2	3																3	...	3	...	3	33	
Child-birth.....	15	18	33		4	4	5	1	1	1	1	3				3	4	7	...	7	...	33		33	
“ Puerperal Convulsions.	2	1	3		1		1			1									3	...	3	...	3	3	
“ Puerperal Fever.....	6	9	15		2	3		1	2	1	2	1				1	1	3	...	3	...	15		15	
Cholera Infantum.....	109	138	247		1	1		1	3	2	5	11	27	30	18	16	10	7	1	3	1	123	124	247	
“ Morbus.....	6	5	11																			3	8	11	
Chorea.....	2	1	3						1				2									3		3	
Colic.....	2	3	5				2			1												5		5	
Consumption.....	287	355	642		23	26	30	25	34	30	26	37	19	24	15	24	21	33	20	34	25	33	25	29	642
Convulsions.....	54	61	115		2	5	3	4	2	5	7	4	3	4	8	5	4	10	6	4	7	5	4	5	115
Croup.....	27	39	66		3	6	3	2	3	2	3	2				1	1	1			4	3	3	2	66
Cyanosis.....	3		3						1																3
Debility.....	58	60	118		6	5	6	1	6	6	2	7	6	5	4	6	8	12	8	6	4	3	2	1	118
“ Birth Premature.....	11	13	24		1	1			3	2	1	1	4		3	2		2	2		1	1	1	1	24
Diabetes.....	12	3	15		1											2	1	3		1	2		6	9	
Diarrhoea.....	25	35	60						2	1	2			2	12	9	5	8	7	6	1	1	2	1	60
“ Chronic.....	6	4	10												1	1	1	1	1	1				10	
Diphtheria.....	75	77	152		8	9	4	7	8	3	6	5	3	5	4	8	3	3	6	9	10	8	10	6	152
Dropsy.....	23	14	37		1	1	1	1	2	2	2	2	3	2	2	1	2	5	1	2		2	3		37
“ of Chest.....	7	2	9						2		1			2		2				1	2	1			9
Dysentery.....	18	9	27						3		1	4	1	4	2	4	3		1	2	2				27
“ Typhoid.....	1		1																						1
Embolism.....	3	1	4						1					1		1	1								4
Enteritis.....	15	18	33		2	3	3	2	2	1	2	1	2	1	2	1	4	5		2	2	1			33

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TABLE VIII.—CAUSES OF DEATH, 1880.

Arranged Alphabetically; showing the Number of each Sex, who died from each cause, in each Month and in the whole year 1880; also the Number of American and of Foreign Parentage, from each cause, for the year.

CAUSES OF DEATH.	PARENTAGE.		Jan. Feb. Mar. April. May. June. July. Aug. Sept. Oct. Nov. Dec.												SEX.	
	Am.	For. Total.	M. F. M. F													

CAUSES OF DEATH.	PARENTAGE.												Jan.												Feb.												Mar.												April.												May.												June.												July.												Aug.												Sept.												Oct.												Nov.												Dec.												SEX.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
	Am.						For.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.						Total.						M.						F.					

TABLE VIII.—CAUSES OF DEATH, 1880.

Arranged Alphabetically; showing the Number of each Sex, who died from each cause, in each Month and in the whole year 1880; also the Number of American and of Foreign Parentage, from each cause, for the year.

PARENTAGE.		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	SEX.										
		M. F.	M. F.	M. F.	M. F.	M. F.	M. F.	M. F.	M. F.	M. F.	M. F.	M. F.	M. F.	M. F.	M. F.	Total.								
Am.	For.	Total.																						
16	30	46	5	1	2	2	2	3	1	4	3	2	4	2	5	1	3	2	2	1	34	12	46	
"	Burns and Scalds.	7	14	21	1	1	1	1	1	1	2	1	1	1	1	1	4	1	1	2	12	9	21	
"	Drowning	15	18	33	4	4	2	1	1	4	3	2	1	4	1	2	3	1	1	2	27	6	33	
"	Falls	6	8	14	2	1	1	1	1	1	1	1	1	1	2	1	2	1	1	10	4	14		
"	Poisoning	1	4	5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	2	5		
"	Railroad	7	11	18	1	1	1	1	1	1	3	1	2	2	2	1	1	2	1	15	3	18		
Abscesses.		4	1	5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	5		
Anæmia.		2	2	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	7	
Anæmia.		5	2	7	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	7	7	14	
Apoplexy.		87	32	119	5	6	3	3	5	6	2	6	5	3	2	4	3	11	9	10	6	5	60	119
Asthma.		6	5	11	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	4	7	11	
Bladder, Disease of.		5	4	9	2	1	1	1	1	1	2	1	1	2	1	1	1	1	1	1	9	9	18	
Bones, Disease of.		5	1	6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	6	6	12	
Bowels, Disease of.		4	5	9	2	1	1	1	1	1	1	1	2	1	2	1	1	1	1	1	7	2	9	
Brain, Disease of.		28	21	49	4	4	3	2	1	2	1	3	1	3	2	2	2	3	1	2	25	24	49	
" Congestion of.		16	8	24	1	1	1	4	3	3	2	1	1	2	2	2	2	3	1	2	13	11	24	
" Inflammation of.		43	45	88	11	7	5	1	2	3	4	3	6	4	2	5	4	2	3	3	49	39	88	
Bronchitis.		44	47	91	2	1	6	5	6	8	11	4	4	5	1	2	2	3	2	1	2	10	6	49
Cancer (various).		49	29	78	2	2	1	1	2	3	3	2	9	2	3	2	1	4	5	3	2	6	4	78
" of Breast.		4	4	8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	8	8
" of Stomach.		10	8	18	2	2	1	1	1	1	3	1	1	1	1	1	1	1	1	1	8	10	18	

CAUSES OF DEATH.		PARENTAGE.												SEX.														
		Jan.		Feb.		Mar.		April.		May.		June.		July.		Aug.		Sept.		Oct.		Nov.		Dec.		Total.		
Am. For.		M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	Total.
Cancer of Uterus.....	10	11	21	5	1	1	1	1	1	1	1	5	1	1	1	4	1	1	1	2	1	1	1	1	1	21	21	
Cancerum Oris.....	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	
Catarrh.....	1	2	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	
Child-birth.....	15	18	33	4	4	5	1	1	1	1	1	1	1	1	3	1	1	1	3	4	7	3	3	3	3	3	33	
“ Puerperal Convulsions.	2	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	
“ Puerperal Fever.....	6	9	15	2	3	1	1	1	1	2	1	1	1	1	2	1	1	2	1	1	1	1	1	1	1	1	15	
Cholera Infantum.....	109	138	247	1	1	1	1	1	3	3	2	5	11	56	51	27	30	18	16	10	7	1	3	1	1	123	124	
“ Morbus.....	6	5	11	1	1	1	1	1	1	1	1	1	1	2	4	4	1	1	1	1	1	1	1	1	1	8	11	
Chorea.....	2	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	3	
Colic.....	2	3	5	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	5	5	
Consumption.....	287	355	642	23	26	30	25	34	30	26	37	19	24	15	24	21	33	20	34	25	33	25	34	25	29	23	26	287
Convulsions.....	54	61	115	2	3	4	2	5	7	4	3	4	8	5	4	10	6	4	7	5	4	5	2	3	7	6	55	60
Croup.....	27	39	66	3	6	3	2	3	2	2	2	1	1	1	1	1	1	4	3	3	2	7	12	5	3	32	34	
Cyanosis.....	3	3	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	
Debility.....	58	60	118	6	5	6	1	6	6	2	7	6	5	4	6	8	12	8	6	4	3	2	1	2	5	7	58	60
“ Birth Premature.....	11	13	24	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Diabetes.....	12	3	15	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Diarrhoea.....	25	35	60	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
“ Chronic.....	6	4	10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Diphtheria.....	75	77	152	8	9	4	7	8	3	6	5	3	5	4	4	8	3	6	9	10	8	10	6	6	6	11	73	79
Dropsy.....	23	14	37	1	1	1	1	2	2	2	2	3	2	3	2	1	2	5	1	2	1	2	1	2	3	1	15	22
“ of Chest.....	7	2	9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	7	9	
Dysentery.....	18	9	27	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	13
“ Typhoid.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Embolism.....	3	1	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	4
Enteritis.....	15	18	33	2	3	2	2	2	1	2	1	2	1	2	1	4	5	1	1	1	2	2	1	1	1	1	19	14

TABLE VIII.—DEATHS, 1880.—Continued.

CAUSES OF DEATH.	PARENTAGE.		SEX.																												
	Am.	For.	Total.	Jan.		Feb.		Mar.		April.		May.		June.		July.		Aug.		Sept.		Oct.		Nov.		Dec.		M.	F.	Total.	
				M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.				
Epilepsy.....	8	6	14	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	7	7	14	
Erysipelas.....	11	5	16	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	10	6	16	
Exposure to cold.....	4	3	7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	5	2	7	
Fever.....	5	8	13	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	5	8	13	
“ Bilious.....	4	4	8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	4	
“ Remittent.....	3	3	6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3
“ Typhoid.....	80	56	136	1	4	4	4	8	2	4	2	7	5	2	2	6	5	12	11	16	14	8	6	5	6	1	1	64	72	136	
“ Yellow.....	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
“ Typhus.....	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Fits.....	14	4	18	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	10	8	18	
Gangrene.....	6	1	7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	3	7	
“ Senile.....	2	2	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2
Heart, Diseases of.....	138	81	219	13	9	19	9	10	9	10	10	9	8	7	9	8	4	10	6	6	9	8	6	9	13	10	8	119	100	219	
“ Hypertrophy of.....	8	4	12	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	6	6	12	
Heat.....	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hemorrhage.....	8	8	16	3	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	7	9	16	
“ from Lungs.....	5	5	10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	6	10	
Hernia.....	4	4	8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	5	3	8	
Hip-Joint, Disease of.....	2	2	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hooping Cough.....	7	13	20	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	10	10	20	
Hydrocephalus.....	23	23	46	2	1	1	4	1	2	3	2	2	2	2	2	1	3	2	2	4	1	1	2	4	1	1	2	23	23	46	
Influenza.....	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Insanity.....	13	6	19	2	1	1	1	2	1	1	1	1	2	1	1	1	2	2	2	1	1	1	1	1	1	1	1	9	10	19	

CAUSES OF DEATH.	PARENTAGE.												SEX.											
	Am.						For.						M.						F.					
	Am.	For.	Total.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	M.	F.	Total.	M.	F.	Total.			
Intemperance.....	5	9	14	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
“ Delirium Tremens.	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
Jaundice.....	2	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
Kidneys, Disease of.....	21	14	35	3	3	4	1	3	1	1	1	1	1	3	3	1	5	3	1	5	35			
“ Bright's Disease of.	30	26	56	1	2	1	2	1	3	3	1	1	4	1	4	3	6	4	2	4	32			
Laryngitis.....	4	4	8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	8			
Leucocythemia.....	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
Liver, Disease of.....	34	15	49	2	1	1	2	4	1	1	4	2	3	1	3	4	5	1	2	2	24			
“ Inflammation of.....	4	2	6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	6			
Lungs, Disease of.....	8	5	13	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	13			
Malformations (all kinds)...	8	5	13	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	13			
Marasmus.....	34	24	58	2	1	3	2	2	4	2	2	1	3	7	4	4	2	3	4	2	31			
Measles.....	2	7	9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	9			
Meningitis Cerebro Spinal.	12	8	20	1	1	1	1	2	1	1	2	1	1	1	1	1	1	1	1	1	20			
“ Spinal.....	2	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3			
Murder.....	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2			
Neuralgia.....	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2			
Old Age.....	186	87	273	9	16	11	12	11	23	9	12	8	15	16	8	7	12	13	11	6	7			
Obstruction of Bowels.....	3	1	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4			
Paralysis.....	70	26	96	7	3	1	1	5	7	5	4	6	2	3	4	2	5	4	5	2	50			
Peritonitis.....	11	13	24	1	1	2	2	1	1	1	1	2	1	3	3	3	2	1	1	2	17			
Pleurisy.....	6	2	8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4			
Pneumonia.....	155	168	323	15	16	14	12	28	20	28	17	22	13	15	4	6	5	4	5	4	13			
“ Congestion of Lungs.	22	19	41	3	1	2	3	3	3	1	2	1	1	2	3	1	1	2	1	3	15			
Prostrate, Disease of.....	4	4	8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	8			
Purpura Hemorrhagica.....	2	2	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4			
Potts Disease.....	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2			

TABLE VIII.—CAUSES OF DEATH, 1880.—Continued.

CAUSES OF DEATH.	PERCENTAGE.		SEX.														
	Am.	For. Total.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	M.	F.	Total.
			M. F.	M. F.	M. F.	M. F.	M. F.	M. F.	M. F.	M. F.	M. F.	M. F.	M. F.	M. F.			
Pyæmia.....	1	...	1	...	...	...	...	...	...	...	...	1	...	...	...	1	1
Quinsy.....	1	1	1	...	...	...	...	...	...	...	...	1	...	...	1	...	1
Rheumatism.....	12	12	24	1	2	1	1	4	1	1	1	1	3	1	2	8	16
Scarlatina.....	216	252	468	29	46	31	24	27	18	26	23	28	14	17	14	18	215
Scrofula.....	8	3	11	...	...	2	...	1	...	...	2	...	1	2	1	1	4
Skin, Disease of.....	1	1	2	...	...	1	...	...	...	...	...	...	...	1	...	2	2
Spine, Disease of.....	4	3	7	...	...	2	...	1	...	1	...	1	...	1	...	5	2
Stomach, Disease of.....	5	5	10	...	...	1	1	1	1	1	1	1	...	...	...	5	5
“ Inflammation of.....	9	9	18	...	...	1	1	1	2	1	1	3	1	1	2	4	14
Suicide.....	8	2	10	...	...	1	1	1	1	2	1	...	...	1	...	5	5
Sunstroke.....	1	...	1	...	...	...	...	...	1	...	...	...	...	1	...	1	1
Syphilis.....	4	3	7	...	...	1	...	...	2	1	1	...	...	2	3	4	7
“ Congenital.....	2	1	3	...	...	...	...	1	...	1	...	...	...	1	1	2	3
Tabes Mesenterica.....	2	1	3	...	...	...	1	...	...	1	...	...	...	1	1	2	3
Teething.....	9	16	25	...	...	1	1	1	...	2	3	1	6	2	1	13	12
Tetanus and Tris. Nascent.....	2	1	3	...	...	...	...	1	...	...	...	...	...	1	1	2	25
Tuberculosis.....	7	5	12	...	...	1	1	2	1	1	...	1	...	...	2	1	3
Tumor.....	9	8	17	...	...	2	...	3	1	1	...	1	2	...	4	8	12
Uterus, Disease of.....	4	3	7	...	...	2	...	1	1	2	...	1	2	...	2	15	17
Unknown.....	92	141	233	14	6	8	12	14	2	6	9	10	14	8	14	10	233

TABLE IX.—CAUSES OF DEATH, 1880.

*Arranged Alphabetically; showing the Number of each Sex, who died from each cause, in each Period of Life.*

CAUSES OF DEATH.	Under 1.		1 and under 2.		2 to 5.		5 to 10.		10 to 15.		15 to 20.		20 to 30.		30 to 40.		40 to 50.		50 to 60.		60 to 70.		70 to 80.		80 and over.		Age not stated.		SEX.		Total.
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
Accidents (various).....	5	4	1	1	1	1	1	2	3	1	3	5	6	1	2	4	1	2	1	1	1	1	1	1	1	1	1	1	34	12	46
“ Burns and Scalds.....	1	1	1	3	1	1	3	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12	9	21
“ Drowning.....	1	1	1	2	1	1	3	1	1	1	4	1	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	27	6	33
“ Falls.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	10	4	14	
“ Poisoning.....	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	2	5	
“ Railroad.....	1	1	1	1	1	1	1	1	1	1	3	5	3	1	2	1	1	1	1	1	1	1	1	1	1	1	1	15	3	18	
Abscesses.....	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	5	
Aneurism.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
Anæmia.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	7
Apoplexy.....	1	1	1	1	1	1	1	1	1	1	1	1	3	4	5	8	7	18	18	20	7	6	1	1	1	1	1	59	60	119	
Asthma.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	2	1	1	1	1	1	1	1	1	4	7	11	
Bladder, Disease of.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	4	1	1	1	1	1	1	1	1	1	10	10	20	
Bones, Disease of.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	5	1	6	
Bowels, Disease of.....	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	7	2	9	
Brain, Disease of.....	5	2	1	4	1	1	1	1	1	1	3	1	2	1	6	2	1	3	1	3	3	2	3	2	3	2	3	25	24	49	
“ Congestion of.....	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	13	11	24	
“ Inflammation of.....	19	17	6	6	9	12	10	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	49	39	88	
Bronchitis.....	16	13	7	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	49	42	91	
Cancer (various).....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	37	41	78	
“ of Breast.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1	1	2	1	2	1	2	1	2	1	1	8	8	16	
“ of Stomach.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	8	10	18	



TABLE VIII.—CAUSES OF DEATH, 1880.—Continued.

CAUSES OF DEATH.	Under 1.		1 and under 2.		2 to 5.		5 to 10.		10 to 15.		15 to 20.		20 to 30.		30 to 40.		40 to 50.		50 to 60.		60 to 70.		70 to 80.		80 and not stated.		SEX.			
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	Total.	
Cancer of Uterus.....														2		3		3		9		2		2				21	21	
Cancerum Oris.....	1	1																									1	1	2	
Catarrh.....	1	2																									3		3	
Child-birth.....									2				17		12		2											33	33	
“ Puerperal Convulsions.													2		1													3	3	
“ Puerperal Fever.....													8		5		2											15	15	
Cholera Infantum.....	100	80	23	44																								123	124	
“ Morbus.....	1				1							1		1		2		1		3		1		1				3	8	11
Chorea.....														2														3	3	5
Colic.....		1			1				1											1								5		
Consumption.....	6	6	4	7	4	3	3	4	10	16	28	93	106	52	83	40	42	30	20	29	26	4	16	4	5	1		287	355	642
Convulsions.....	34	30	13	9	6	15	2	2					3														55	60	115	
Croup.....	6	8	5	11	15	7	5	1																			32	34	66	
Cyanosis.....	2	1																									2	1	3	
Debility.....	34	29	3	3			1	1	1	2	1	1															58	60	118	
“ Birth Premature.....	16	8																									16	8	24	
Diabetes.....					1				1																		6	9	15	
Diarrhoea.....	18	12	3	8	4	2	1		1																		31	29	60	
“ Chronic.....																											3	7	10	
Diphtheria.....	8	7	8	30	25	22	20	1	13	1	5	3															73	79	152	
Dropsy.....					1		1	1	2				2														15	22	37	
Dropsy of Chest.....	1												1														7	2	9	
Dysentery.....	2	2	4	1	3	1	1	1																			14	13	27	





CAUSES OF DEATH.	Under 1 and under 2.												Age and not stated.												SEX.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
	1 and under 1.			2 to 5.			5 to 10.			10 to 15.			15 to 20.			20 to 30.			30 to 40.			40 to 50.			50 to 60.			60 to 70.			70 to 80.			80 and over.			M.	F.	Total.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
Pneumonia .....	22	20	9	9	10	8	7	8	2	4	12	7	6	15	14	19	15	24	22	20	21	18	20	4	7	159	164	323	159	164	323	21	20	41	5	1	6	1	1	2																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
“ Congestion of Lungs.	4	4	2	1	5	1	1	1	1	1	1	1	1	3	2	1	1	1	1	1	1	1	1	1	1	4	1	5	5	1	6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1</

TABLE X.—CLASSIFICATION AND PERCENTAGE—1880.

*Showing what part of the Mortality in the whole State, and in each Division is ascribed to each cause and class of causes.*

NUMBER OF DEATHS IN EACH DIVISION OF THE STATE.						PERCENTAGE OF DEATHS IN EACH DIVISION.							
CAUSES OF DEATH.						Percentage in the Whole State.							
Kent County.	Newport County Towns.	Newport City.	Providence County Towns.	Providence City.	Washington County.	Whole State.	Washington County.	Providence City.	Providence County Towns.	Newport City.	Newport County Towns.	Kent County.	Bristol County.
9306	107243	1588	2080	286	4829	All Causes.....	100.00	100.00	100.00	100.00	100.00	100.00	100.00
9293	105219	1437	2063	270	4596	Specified Causes.....	100.00	100.00	100.00	100.00	100.00	100.00	100.00
571	1338	451	576	87	1,291	I. ZYMOTIC DISEASES.....	28.09	32.22	27.82	31.41	17.35	24.23	26.31
						SPORADIC DISEASES.							
124	1231	158	184	22	462	II. GENERAL OR NOT LOCALIZED	10.04	8.14	8.93	10.92	14.15	11.43	8.13
37	1932	203	251	27	599	III. NERVOUS SYSTEM.....	13.02	10.00	12.18	14.14	14.62	18.09	12.54
76	2142	320	594	56	1,160	IV. RESPIRATORY SYSTEM.....	25.22	20.75	28.80	22.29	19.18	20.00	26.05
27	216	24	107	9	237	V. CIRCULATORY SYSTEM.....	5.15	3.33	5.20	4.27	10.97	5.72	7.20
10	915	53	93	13	199	VI. DIGESTIVE SYSTEM.....	4.33	4.81	4.51	3.68	6.84	8.59	3.41
8	39	36	59	2	120	VII. URINARY SYSTEM.....	2.65	.74	2.87	2.50	4.10	2.87	2.71
4	43	9	20	3	43	VIII. GENERATIVE SYSTEM.....	0.94	1.11	.98	.63	.....	2.86	1.37
4	...	2	22	2	40	IX. LOCOMOTIVE SYSTEM.....	0.87	.74	1.07	.56	.91	.....	1.37
...	...	8	2	...	2	X. INTEGUMENTIVE SYSTEM.....	.04	.....	.09	.....	.....	.....	.....
20	1519	90	73	44	273	XI. OLD AGE.....	5.95	16.30	3.56	6.25	8.68	14.25	6.83
18	47	48	82	5	170	XII. EXTERNAL CAUSES.....	3.70	1.86	3.99	3.35	3.20	3.81	6.16

I. ZYMOTIC DISEASES.																	
11	3	7	93	100	20	247	Cholera Infantum.....	5.43	7.41	4.84	6.47	3.20	2.86	3.75	6.22		
...	...	...	6	4	...	11	Cholera Morbus .....	0.24	...	.19	.42	...	...	...	.48		
3	1	3	20	30	6	66	Croup.....	1.45	2.21	1.45	1.39	1.37	.95	1.02	1.44		
1	...	10	24	30	4	70	Diarrhoea.....	1.52	1.48	1.45	1.67	4.56	...	.34	.48		
6	...	2	63	61	17	152	Diphtheria.....	3.40	6.30	2.94	4.38	.91	...	2.05	1.44		
5	...	...	8	12	...	28	Dysentery .....	.61	...	.58	.56	...	...	1.71	1.44		
2	1	...	4	8	1	16	Erysipelas .....	.34	.37	.38	.28	...	.95	.68	...		
1	1	...	9	1	1	13	Fever .....	.30	.37	.04	.63	...	.95	.34	...		
1	...	...	1	1	1	4	Fever, Bilious.....	.09	.37	.04	.07	...	...	.34	...		
...	...	1	2	12	...	15	Fever, Puerperal.....	.33	...	.58	.14	.46	...	...	...		
1	...	...	...	1	1	3	Fever, Remittent.....	.06	.37	.04	...	...	...	.34	...		
8	3	57	49	12	137	Fever, Typhoid and Typhus.....	2.99	4.44	2.37	3.97	1.37	...	...	2.73	3.82		
1	...	...	...	...	...	1	Fever, Yellow.....	.02	...	...	...	...	...	.34	...		
...	...	2	6	11	1	20	Hooping Cough.....	.44	.37	.52	.42	.91	...	...	...		
...	...	...	6	3	...	9	Measles.....	.20	...	.14	.42	...	...	...	...		
1	2	2	5	5	4	20	Meningitis, Cerebro-Spinal.....	.44	1.48	.24	.36	.91	1.90	.34	.48		
...	...	1	...	...	...	1	Pyæmia .....	.02	...	...	...	.46	...	...	...		
30	4	7	143	243	19	468	Scarlatina ...	9.99	7.05	11.78	9.94	3.20	3.80	10.25	10.51		
...	1	...	4	5	...	10	Syphilis .....	.22	...	.24	.28	...	.95	...	...		
71	13	38	451	576	87	1,291	Total .....	28.09	32.22	27.82	31.40	17.35	12.38	24.23	26.31		
II. GENERAL OR NOT LOCALIZED.																	
...	...	...	...	4	1	5	Abscesses .....	.10	.38	.19	...	...	...	...	...		
...	...	...	3	3	1	7	Anæmia .....	.15	.38	.15	.20	...	...	...	...		
10	2	10	26	68	4	125	Cancer .....	2.72	1.49	3.30	1.80	4.54	1.90	3.40	2.28		
...	...	...	...	3	...	3	Cyanosis .....	.07	...	.15	...	...	...	...	...		
5	2	8	84	27	7	142	Debility .....	3.09	2.59	1.31	5.83	3.73	1.90	1.68	4.30		
1	3	2	18	5	2	37	Dropsy, General.....	.81	.76	.24	1.24	.91	2.88	.34	2.88		
1	2	2	1	...	3	9	Gangrene.....	.19	1.02	...	.07	.91	1.90	.34	...		

TABLE X.—CLASSIFICATION AND PERCENTAGE, 1880.—Continued.

NUMBER OF DEATHS IN EACH DIVISION OF THE STATE.						PERCENTAGE OF DEATHS IN EACH DIVISION.								
CAUSES OF DEATH.						Percentage in the Whole State.								
Whole State.						Washington County.	Providence City.	Providence County Towns.	Newport City.	Newport County Towns.	Kent County.	Bristol County.		
Newport County Towns.	Newport City.	Providence County Towns.	Providence City.	Washington County.	Whole State.									
1	1	2	3	7	2	16 Hemorrhage.....	.34	.76	.34	.20	.91	.95	.34	.....
.....	.....	.....	.....	1	1	1 Leucocythæmia.....	.02	.....	.05	.....	.....	.....	.....	.....
1	.....	.....	.....	8	.....	13 Malformation.....	.28	.....	.39	.....	.91	.....	.34	.96
.....	1	4	13	37	.....	58 Marasmus.....	1.27	.....	1.79	.90	1.80	.95	.....	1.44
.....	.....	1	2	3	.....	6 Purpura Hemorrhagica.....	.13	.....	.15	.14	.....	.95	.....	.....
1	.....	3	3	2	2	11 Scrofula.....	.24	.76	.10	.20	.....	.....	.34	1.44
1	.....	1	1	9	.....	12 Tuberculosis.....	.26	.....	.43	.07	.44	.....	.34	.....
3	.....	4	4	7	.....	17 Tumors.....	.37	.....	.34	.27	.....	.....	1.01	1.44
24	12	31	158	184	22	Total.....	10.04	8.14	8.93	10.92	14.15	11.43	8.13	14.84
III. NERVOUS SYSTEM.														
13	5	6	43	45	6	119 Apoplexy.....	2.58	2.23	2.19	2.99	2.76	4.76	4.41	.48
2	1	1	8	9	1	24 Brain, Congestion of.....	.52	.38	.43	.56	.45	.95	.68	.95
2	2	1	19	22	3	49 " Diseases of.....	1.05	1.02	1.08	1.32	.45	1.93	.68	.....
2	.....	6	28	49	2	88 " Inflammation of.....	1.92	.76	2.38	1.95	2.76	.....	.68	.49
.....	.....	3	.....	.....	.....	3 Chorea.....	.07	.....	.....	.20	.....	.....	.....	.....
13	.....	9	54	49	4	133 Convulsions and Fits.....	2.88	1.49	2.38	3.77	4.12	.....	4.48	1.92
.....	.....	.....	1	.....	.....	1 Delirium Tremens.....	.02	.....	.....	.07	.....	.....	.....	.....





TABLE X.—CLASSIFICATION AND PERCENTAGE—1880.—Continued.

NUMBER OF DEATHS IN EACH DIVISION OF THE STATE.						PERCENTAGE OF DEATHS IN EACH DIVISION.								
CAUSES OF DEATH.						PERCENTAGE IN THE WHOLE STATE.								
Kent County.	Newport County Towns.	Newport City.	Providence County Towns.	Providence City.	Washington County.	Providence County.	Kent County.	Bristol County.						
VI. DIGESTIVE SYSTEM.														
...	1	2	6	1	3	13	Bowels, Diseases of.....	.28	1.11	.05	.42	.91	.95	...
...	...	...	2	...	...	2	Cancrum Oris.....	.04	...	...	.14	...	...	...
...	1	...	2	2	...	5	Colic.....	.11	...	.09	.14	...	.95	...
2	1	...	9	19	1	33	Enteritis.....	.73	.37	.94	.62	...	.95	.68
...	1	...	2	4	1	8	Hernia.....	.17	.37	.19	.14	...	.95	...
...	...	...	3	...	...	3	Jaundice.....	.07	...	...	.21	...	...	...
3	2	6	12	25	3	55	Liver, Diseases of.....	1.20	1.11	1.23	.83	2.73	1.92	1.91
...	2	4	4	13	1	24	Peritonitis.....	.51	.37	.63	.28	1.82	1.92	...
4	...	1	8	10	4	28	Stomach, Diseases of.....	.60	1.48	.48	.55	.46	...	.48
...	...	...	...	3	...	3	Tabes Mesenterica.....	.07	...	.14	...	...	...	...
1	1	2	5	16	...	25	Teething.....	.55	...	.76	.35	.92	.95	.34
10	9	15	53	93	13	199	Total.....	4.33	4.81	4.51	3.68	6.84	8.59	3.41
2.87														
VII. URINARY SYSTEM.														
1	...	...	3	6	...	10	Bladder, Diseases of.....	.22	...	.29	.21	...	...	.34
2	...	...	5	6	...	15	Diabetes.....	.33	...	.29	.34	...	...	.68
.96														

1	5	2	8	27	46	2	91	Kidneys, Diseases of.....	2.02	.74	2.24	1.88	3.64	1.92	1.71	.48
3	8	3	9	36	59	2	4	Prostate, Diseases of.....	.08	.....	.05	.07	.46	.95	.....	.....
								Total .....	2.65	.74	2.87	2.50	4.10	2.87	2.73	1.44
VIII. GENERATIVE SYSTEM.																
4	4	2	...	8	12	3	33	Child-birth.....	.72	1.11	.58	.56	.....	1.91	1.37	1.91
...	...	...	...	...	3	...	3	" Puerperal Convulsions..	.06	.....	.14	.....	.....	.....	.....	.....
...	...	1	...	1	5	...	7	Uterus, Disease of .....	.16	.....	.26	.07	.....	.95	.....	.....
4	4	3	...	9	20	3	43	Total .....	0.94	1.11	.98	.63	.....	2.86	1.37	1.91
IX. LOCOMOTIVE SYSTEM.																
...	...	...	...	...	6	...	6	Bone, Diseases of.....	.13	.....	.29	.....	.....	.....	.....	.....
1	...	...	...	...	1	...	2	Hip-Joint, Diseases of .....	.04	.....	.05	.....	.....	.....	.....	.47
1	3	...	2	5	11	2	24	Rheumatism .....	.52	.74	.54	.34	.91	.....	1.03	.47
...	1	...	...	3	4	...	8	Spine, Diseases of .....	.18	.....	.19	.22	.....	.....	.34	.....
2	4	...	2	8	22	2	40	Total .....	.87	.74	1.07	.56	.91	.....	1.37	.94
X. INTEGUMENTIVE SYSTEM.																
...	...	...	...	...	2	...	2	Skin, Diseases of.....	.04	.....	.09	.....	.....	.....	.....	.....
...	...	...	...	...	2	...	2	Total .....	.04	.....	.09	.....	.....	.....	.....	.....
2	20	15	19	90	73	44	273	XI. OLD AGE.	5.95	16.30	3.56	6.25	8.68	14.25	6.83	5.75
XII. EXTERNAL CAUSES.																
1	5	3	2	13	20	2	46	Accidents (various.) .....	1.00	.74	.96	.90	.91	2.86	1.71	.48
...	...	...	...	4	11	...	21	" Burns and Scalds .....	.50	.....	.54	.28	.91	.....	1.37	...

TABLE X.—CLASSIFICATION AND PERCENTAGE, 1880.—Continued.

NUMBER OF DEATHS IN EACH DIVISION OF THE STATE.						PERCENTAGE OF DEATHS IN EACH DIVISION.					
CAUSES OF DEATH.						PERCENTAGE OF DEATHS IN EACH DIVISION.					
CAUSES OF DEATH.						PERCENTAGE OF DEATHS IN EACH DIVISION.					
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CAUSES OF DEATH.						PERCENTAGE OF DEATHS IN EACH DIVISION.					
CAUSES OF DEATH.</											

TABLE XI.—OCCUPATIONS AND AGES AT DEATH, 1880.

*Showing the Average Age at Death in the several Occupations, Providence City being separated from the rest of the State, and ages under twenty being excluded.*

OCCUPATIONS.	WHOLE STATE.			PROVIDENCE CITY.			REST OF STATE.		
	Number who Died.	Aggregate Age.	Average Age.	Number who Died.	Aggregate Age.	Average Age.	Number who Died.	Aggregate Age.	Average Age.
<b>I. AGRICULTURE.</b>									
Farmers .....	183	12,273	67.06	9	575 <sup>1</sup>	63.88	174	11,698	67.23
Gardeners .....	5	340	68.00	4	276	69.00	1	64	64.00
				13	851	.....	175	11,762	.....
<b>II. PROFESSIONAL AND PERSONAL SERVICES.</b>									
Actors .....	1	26	26.00				1	26	26.00
Artists .....	1	42	42.00	1	42	42.00	...	...	...
Barbers .....	6	211	35.17	4	113	28.25	2	98	49.00
Civil Engineers .....	2	125	62.50	...	...	...	2	125	62.50
Clergymen .....	6	425	70.83	1	66	66.00	5	359	71.80
Clerks and Salesmen.	34	1,065	31.32	28	846	30.21	6	219	36.50
Coachmen .....	3	143	47.66	3	143	47.66	...	...	...
Collectors. ....	1	82	82.00	1	82	82.00	...	...	...
Cooks .....	2	130	65.00	2	130	65.00	...	...	...
Dentists .....	1	23	23.00	1	23	23.00	...	...	...
Firemen .....	3	127	42.33	3	127	42.33	...	...	...
Editors .....	1	59	59.00	...	...	...	1	59	59.00
Hotel-keepers .....	6	311	51.83	2	99	49.50	4	212	53.00
Laborers .....	219	10,198	46.53	116	5,086	43.84	103	5,112	49.60
Lawyers .....	6	451	75.17	...	...	...	6	451	75.17
Musicians .....	1	46	46.00	1	46	46.00	...	...	...
Music-teachers .....	1	71	71.00	...	...	...	1	71	71.00
Photographers. ....	2	73	36.50	2	73	36.50	...	...	...
Physicians .....	7	396	56.57	1	62	62.00	6	334	55.66
Policemen .....	1	40	40.00	...	...	...	1	40	40.00
Reporters .....	1	34	34.00	1	34	34.00	...	...	...
Saloon-keepers .....	9	349	38.77	6	224	37.33	3	125	41.66
Students .....	8	172	21.50	3	64	21.33	6	108	18.00
Teachers .....	3	124	41.33	2	103	51.50	1	21	21.00
Waiters .....	2	52	26.00	1	30	30.00	1	22	22.00
Watchmen .....	2	112	56.00	2	112	56.00	...	...	...
	518	27,500	.....	181	7,505	.....	149	7,382	.....
<b>III. TRADE AND TRANSPORTATION.</b>									
Agents .....	8	422	52.75	5	253	50.60	3	169	56.33

TABLE XI.—OCCUPATIONS, 1880.—Continued.

OCCUPATIONS.	WHOLE STATE.			PROVIDENCE CITY.			REST OF STATE.		
	Number who Died.	Aggregate Age.	Average Age.	Number who Died.	Aggregate Age.	Average Age.	Number who Died.	Aggregate Age.	Average Age.
Apothecaries .....	1	75	75.00	1	75	75.00	...	...	...
Bankers .....	1	54	54.00	1	54	54.00	...	...	...
Book-keepers .....	7	295	42.14	6	263	43.83	1	32	32.00
Boatmen .....	1	28	28.00	...	...	...	1	28	28.00
Brokers .....	2	94	47.00	1	64	64.00	1	30	30.00
Butchers .....	4	189	47.25	1	39	39.00	3	150	50.00
Cashiers (Bank, &c.)	3	241	80.33	2	162	81.00	1	79	79.00
Confectioners .....	1	79	79.00	...	...	...	1	79	79.00
Conductors .....	1	37	37.00	1	37	37.00	...	...	...
Expressmen .....	1	27	27.00	...	...	...	1	27	27.00
Fishermen and Oys- termen .....	5	255	51.00	...	...	...	5	255	51.00
Grocers .....	8	363	45.38	4	198	49.50	4	165	41.25
Government Inspec- tors .....	2	114	57.00	2	114	57.00	3	122	40.66
Hackmen .....	3	122	40.66	...	...	...	...	...	...
Liquor Dealers .....	4	144	36.00	4	144	38.00	...	...	...
Mariners .....	6	246	41.00	5	210	42.00	1	36	36.00
Marketmen .....	2	145	72.50	2	145	72.50	...	...	...
Merchants .....	21	1,298	61.81	17	1,072	63.06	4	226	56.50
Peddlers .....	11	509	46.30	5	176	35.20	6	333	55.50
Pilots .....	1	44	44.00	1	44	44.00	...	...	...
R. R. Station Agents	2	94	47.00	...	...	...	2	94	47.00
Sea Captains .....	12	822	68.50	5	304	60.80	7	518	75.45
Seamen, Ord. ....	9	505	...	4	272	68.00	5	233	46.60
Teamsters .....	11	424	38.55	8	312	39.00	3	112	37.33
Treasurers .....	1	81	81.00	1	81	...	...	...	...
Tobacconists .....	2	129	64.50	2	129	63.00	...	...	...
Traders and Dealers.	6	328	54.66	1	42	42.00	5	286	57.20
	136	7,164	...	79	4,190	...	57	2,974	...
IV. MANUFACTURES, MECHANICAL AND MINING INDUSTRIES.									
Bakers .....	3	144	48.00	2	124	62.00	1	20	20.00
Belt-makers .....	2	127	63.50	2	127	63.50	...	...	...
Blacksmiths .....	14	806	57.57	3	162	53.33	11	644	58.55
Block-makers .....	1	52	52.00	1	52	52.00	...	...	...
Boat-builders .....	2	132	66.00	...	...	...	2	132	66.00
Boiler-makers .....	2	104	52.00	...	...	...	2	104	52.00
Book-binders .....	5	140	28.00	5	140	28.00	...	...	...
Boot and Shoe-mak- ers .....	6	368	61.33	...	...	...	6	368	61.33
Brass Founders .....	3	221	73.66	3	221	73.66	...	...	...

TABLE XI.—OCCUPATIONS, 1880.—Continued.

OCCUPATIONS.	WHOLE STATE.			PROVIDENCE CITY.			REST OF STATE.		
	Number who Died.	Aggregate Age.	Average Age.	Number who Died.	Aggregate Age.	Average Age.	Number who Died.	Aggregate Age.	Average Age.
Brewers .....	1	70	70.00	1	70	70.00	...	...	...
Brush-makers .....	1	74	74.00	...	...	...	1	73	74.00
Builders and Contractors .....	2	112	56.00	2	112	56.00	...	...	...
Cabinet-makers .....	6	400	66.66	3	199	66.33	3	201	67.00
Carpenters .....	43	2,390	55.58	20	1,018	50.90	23	1,372	59.65
Carriage-makers .....	1	39	39.00	...	...	...	1	39	39.00
Cigar-makers .....	3	144	48.00	2	88	44.00	1	56	56.00
Coopers .....	3	170	56.66	3	170	56.66	...	...	...
Die Sinkers .....	1	58	58.00	1	58	58.00	...	...	...
Dyers .....	6	225	37.50	4	173	43.25	2	52	26.00
Engineers .....	6	290	48.33	6	290	48.33	...	...	...
Engravers .....	2	98	49.50	2	98	49.00	...	...	...
File Cutters .....	3	238	79.33	3	238	79.33	...	...	...
Harness-makers .....	4	162	40.50	3	112	37.33	1	50	50.00
Hatters .....	2	61	30.50	...	...	...	2	61	30.50
House Movers .....	1	80	80.00	...	...	...	1	80	80.00
Inventors .....	1	48	48.00	1	48	48.00	...	...	...
Jewelers .....	21	831	39.57	16	611	38.13	5	220	44.00
Machinists .....	36	1,737	48.28	18	848	47.11	18	889	49.22
Manufacturers .....	15	941	62.74	10	625	62.50	5	316	63.20
Masons .....	19	1,036	54.53	14	753	53.71	5	283	56.60
Mechanics .....	14	825	58.93	7	334	47.51	7	491	70.14
Millwrights .....	1	73	73.00	...	...	...	1	73	73.00
Moulders .....	6	244	40.66	6	244	40.66	...	...	...
Operatives .....	66	2,259	34.23	18	536	29.77	48	1,723	35.89
Overseers and Superintendents .....	4	234	58.50	3	168	56.00	1	66	66.00
Painters .....	27	1,292	47.84	16	765	47.66	11	527	47.91
Pattern-makers .....	3	229	76.33	2	144	72.00	1	85	85.00
Piano Makers .....	1	42	42.00	1	42	42.00	...	...	...
Plumbers .....	3	121	40.33	1	20	20.00	2	101	50.50
Printers .....	8	349	43.62	4	167	41.75	4	182	45.50
Ship Carpenters .....	4	273	68.25	1	76	76.00	3	197	65.66
Silversmiths .....	2	107	53.50	2	107	53.50	...	...	...
Stone Cutters .....	6	393	65.50	3	186	62.00	3	207	69.00
Tailors .....	10	567	56.70	6	336	56.00	4	231	57.75
Tinsmiths .....	5	202	40.40	3	76	25.33	2	126	63.00
Upholsterers .....	3	89	29.66	2	64	32.00	1	25	25.00
Wheelwrights .....	3	167	55.66	...	...	...	3	167	55.66
<b>V. FEMALES.</b>	<b>381</b>	<b>18,068</b>	<b>...</b>	<b>200</b>	<b>9,602</b>	<b>...</b>	<b>181</b>	<b>9,162</b>	<b>...</b>
Boarding-housekeepers .....	11	671	61.00	11	671	61.00	...	...	...

TABLE XI.—OCCUPATIONS, 1880.—Concluded.

OCCUPATIONS.	WHOLE STATE.			PROVIDENCE CITY.			REST OF STATE.		
	Number who Died.	Aggregate Age.	Average Age.	Number who Died.	Aggregate Age.	Average Age.	Number who Died.	Aggregate Age.	Average Age.
Dressmakers and Seamstresses .....	11	374	34.00	7	230	32.86	4	144	36.00
Housekeepers .....	312	18,376	58.09	2	97	48.50	310	18,279	59.00
Operatives .....	10	320	32.00	5	188	37.60	5	132	26.40
Servants .....	14	537	38.36	14	537	38.36	...	...	...
Tailoresses .....	4	209	52.25	2	51	25.50	2	158	79.00
Teachers .....	2	106	53.00	1	31	31.00	1	75	75.00
	364	20,593	.....	42	1,805	.....	322	18,788	.....

TABLE XI.—RECAPITULATION BY CLASSES.

OCCUPATIONS.	WHOLE STATE.			PROVIDENCE CITY.			REST OF STATE.		
	Number who Died.	Aggregate Age.	Average Age.	Number who Died.	Aggregate Age.	Average Age.	Number who Died.	Aggregate Age.	Average Age.
I. AGRICULTURE .....	188	12,613	67.09	13	851	65.46	175	11,762	67.20
II. PROFESSIONAL AND PERSONAL SERVICES...	518	27,500	53.09	181	7,505	41.46	149	7,382	49.54
III. TRADE AND TRANSPORTATION..	136	7,164	52.68	79	4,190	53.04	57	2,974	52.18
IV. MANUFACTURES, MECHANICAL AND MINING INDUSTRIES.	381	18,068	47.42	200	9,602	48.01	181	9,162	50.62
V. FEMALES..	364	20,593	56.57	42	1,805	42.97	322	18,788	58.32
ALL CLASSES.	1,587	83,938	53.00	515	23,594	45.81	884	50,068	56.63











OCCUPATIONS.	Number of given causes.
Gas Filters.....	1
Glaucina.....	1
Gumsmith.....	1
Harness Makers.....	1
Hatter.....	1
Horse-Mover.....	1
Iccemen.....	1
Iron Worker.....	1
Jewelers.....	1
Machinists.....	1
Manufacturers.....	1
Masons.....	1
Mechanics.....	1
Millwright.....	1
Miners.....	1
Moulders.....	1
Operatives.....	1
Overseers and Superintendents.....	1
Painters.....	1
Pattern Makers.....	1
Paper Hangers.....	1
Piano Maker.....	1
Pipers.....	1
Printers.....	1
Riggers.....	1
Roll Coverer.....	1
Rope Makers.....	1
Rubber Workers.....	1
Sail Makers.....	1
Ship Carpenters.....	1
Abscess.....	3
Accident.....	3
Aneurism.....	3
Apoplexy and Paralysis.....	3
Asthma.....	3
Bladder, Diseases of.....	3
Brain, Diseases of.....	3
Bronchitis.....	3
Cancer.....	3
Cholera Morbus.....	3
Colic.....	3
Consumption.....	3
Debility.....	3
Diabetes.....	3
Diphtheria.....	3
Dropsy.....	3
Dysentery.....	3
Epilepsy.....	3
Krystelias.....	3
Gangrene.....	3
Heart, Diseases of.....	3
Hemorrhage.....	3
Hernia.....	3
Insanity.....	3
Intemperance.....	3
Kidneys, Disease of.....	3
Liver, Diseases of.....	3
Lungs, Acute Diseases of.....	3
Martismus.....	3
Meningitis, Cerebro Spinal.....	3
Obstruction of the Bowels.....	3
Old Age.....	3
Peritonitis.....	3
Pleurisy.....	3
Pyemia.....	3
Rheumatism.....	3
Stomach, Diseases of.....	3
Syphilis.....	3
Tetanus.....	3
Tuberculosis.....	3
Tumor.....	3
Xiphoid.....	3
Bone, Disease of.....	3







TABLE XII.—RECAPITULATION BY CLASSES.

OCCUPATIONS.		Whole Number of given causes.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
I. AGRICULTURE.....	176	2	23	5	4	2	4	1	17	1	1	2	4	1	2	4	1	3	1	2	4	2	17	1	2	6	14	1	53	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Of diseases not stated above, there were the following in addition:

In Class I., there were three Farmers who committed suicide, and one died from Scarlatina.

In Class II., one Laborer died from Suicide, and one from enlarged Prostate, one Physician died of Scarlatina.

In Class III., one Fisherman died of Scarlatina, one Operative of diseased Prostate, and one Trader committed suicide.

In Class V., one Housekeeper committed suicide.





## RESULTS AND OBSERVATIONS, 1880.

The whole number of births recorded in the state of Rhode Island during the year 1880, was six thousand two hundred and ninety-five (6,295); the whole number of marriages two thousand seven hundred and sixty-nine (2,769); and the whole number of deaths four thousand eight hundred and twenty-nine (4,829).

TABLE XIII.

*Presenting the general results of Registration in the State, during each of the last twenty-seven years.*

Year.	Whole Number of Births.	Still-born.	Living Births.	Marriages.	Deaths.
1854.....	2,105.....	78.....	2,027.....	1,047.....	1,730.....
1855.....	2,936.....	124.....	2,802.....	1,375.....	1,846.....
1856.....	2,906.....	183.....	2,723.....	1,535.....	2,042.....
1857.....	4,036.....	185.....	3,851.....	1,526.....	2,325.....
1858.....	4,263.....	177.....	4,086.....	1,438.....	2,616.....
1859.....	4,500.....	177.....	4,323.....	1,672.....	2,370.....
1860.....	4,660.....	167.....	4,493.....	1,748.....	2,686.....
1861.....	4,440.....	146.....	4,294.....	1,583.....	2,927.....
1862.....	4,125.....	123.....	4,002.....	1,450.....	2,591.....
1863.....	3,691.....	111.....	3,580.....	1,618.....	3,207.....
1864.....	3,892.....	138.....	3,754.....	1,844.....	3,360.....
1865.....	3,955.....	177.....	3,778.....	1,896.....	3,405.....
1866.....	4,902.....	172.....	4,730.....	2,318.....	2,970.....
1867.....	5,127.....	163.....	4,964.....	2,344.....	2,889.....
1868.....	5,372.....	212.....	5,160.....	2,285.....	2,912.....
1869.....	5,245.....	220.....	5,025.....	2,289.....	3,383.....
1870.....	5,215.....	234.....	4,981.....	2,362.....	3,238.....
1871.....	5,078.....	223.....	4,855.....	2,336.....	3,344.....
1872.....	6,143.....	202.....	5,941.....	2,537.....	4,247.....
1873.....	6,062.....	226.....	5,794.....	2,630.....	4,403.....
1874.....	6,466.....	277.....	6,189.....	2,541.....	4,229.....
1875.....	6,508.....	246.....	6,262.....	2,485.....	4,317.....
1876.....	6,339.....	224.....	6,105.....	2,253.....	4,116.....
1877.....	6,235.....	242.....	5,993.....	2,282.....	4,450.....
1878.....	6,714.....	248.....	6,466.....	2,324.....	4,441.....
1879.....	6,350.....	216.....	6,134.....	2,396.....	4,472.....
1880.....	6,295.....	192.....	6,103.....	2,769.....	4,829.....

The aggregates for the whole period of 27 years are, of recorded births, 128,140, of whom 4,869 were still-born, and 123,271 were living children.

Of marriages recorded there were 52,431, or 104,862 persons married; and of recorded deaths, 84,762 persons.

On the next page the usual Table is given, showing a comparison of the births, marriages and deaths, with the population, in each town in the State, for the year 1880.

TABLE XIV.

BIRTHS, MARRIAGES AND DEATHS IN RHODE ISLAND,  
IN 1880, COMPARED WITH THE POPULATION  
BY THE CENSUS OF 1880.

TOWNS AND DIVISIONS OF THE STATE.	Population in 1880.	Births in 1880.	To population one birth in.	Marriages in 1880.	To population one person married in.	Deaths in 1880.	Of population one death in.	Deaths in each 100 of the population.
Barrington.....	1,359	17	80.00	12	56.60	21	64.71	1.54
Bristol.....	6,028	181	33.30	30	100.46	121	49.82	2.01
Warren.....	4,007	80	50.01	55	36.36	77	52.07	1.92
BRISTOL COUNTY.....	11,394	278	40.00	97	58.73	319	52.01	1.98
Coventry.....	4,519	67	67.31	45	50.31	61	74.08	1.35
East Greenwich.....	2,887	53	54.35	43	33.49	53	54.47	1.94
West Greenwich.....	1,018	23	44.26	8	63.62	23	44.36	2.95
Warwick.....	12,164	297	40.96	121	50.36	169	71.98	1.39
KENT COUNTY.....	20,588	440	46.79	217	47.42	306	67.38	1.49
Jamestown.....	459	5	91.80	2	114.75	2	239.50	.44
Little Compton.....	1,302	14	85.86	3	300.33	15	80.13	1.25
Middletown.....	1,139	29	39.28	6	94.92	16	71.19	1.40
New Shoreham.....	1,303	10	120.40	13	46.37	6	200.50	.49
Portsmouth.....	1,979	32	61.84	11	89.95	26	76.12	1.31
Tiverton.....	2,505	50	50.10	36	34.79	42	59.52	1.08
TOWNS, NEWPORT COUNTY.....	8,487	140	60.62	71	59.77	107	79.22	1.36
NEWPORT CITY.....	15,693	399	39.32	123	64.20	243	64.58	1.54
Burillville.....	5,714	125	45.71	42	68.02	105	54.42	1.94
Cranston.....	5,940	120	49.50	22	135.00	146	40.68	2.48
Cumberland.....	6,445	143	45.07	56	57.55	107	60.23	1.68
East Providence.....	5,056	124	40.77	40	63.20	77	65.58	1.52
Foster.....	1,552	22	70.54	26	29.85	21	73.90	1.37
Glocester.....	2,250	46	48.91	19	59.21	42	53.57	1.80
Johnston.....	5,765	146	39.49	23	131.02	81	71.17	1.40
Lincoln.....	13,765	299	46.04	90	76.47	188	73.22	1.37
North Providence.....	1,467	29	50.54	...	...	16	91.25	1.09
North Smithfield.....	8,088	21	147.00	27	57.19	45	68.68	1.45
Pawtucket.....	19,090	404	47.10	204	46.64	351	54.31	1.84
Scituate.....	3,810	78	48.85	31	61.47	58	65.59	1.52
Smithfield.....	3,065	56	55.69	18	85.69	38	80.45	1.07
Woonsocket.....	16,050	371	43.26	187	42.91	318	50.47	1.98
TOWNS, PROVIDENCE COUNTY.....	93,017	1,984	46.88	784	59.32	1,563	58.57	1.70
PROVIDENCE CITY.....	104,857	2,626	39.92	1,231	43.59	2,080	54.12	1.96
Charlestown.....	1,117	13	85.92	13	43.96	15	74.47	1.34
Exeter.....	1,310	30	43.67	14	46.79	20	65.50	1.53
Hopkinton.....	2,952	62	47.61	60	24.80	34	86.52	1.12
North Kingstown.....	3,949	90	43.88	35	56.41	67	58.44	1.79
South Kingstown.....	5,114	88	58.11	36	70.03	40	128.00	.78
Richmond.....	1,940	41	47.29	3	334.83	33	59.06	1.70
Westerly.....	6,104	104	58.69	85	35.91	77	79.27	1.36
WASH.....	22,495	428	52.56	246	45.72	286	86.65	1.37
WHE.....	776,531	6,295	43.93	2,769	49.93	4,829	57.26	1.75

In Table XIII will be found the general results of registration in the whole State, during each of the last twenty-seven years.

It will be observed that the number of births, marriages and deaths do not occur with any regularity from year to year, but that the opposite is the rule. At the same time there is a gradually increasing number of each of the classes of events, taking periods of five years together, corresponding in some degree with the increase of population.

A comparison of the results of registration during the year 1880, with the previous year, will show that of the whole number of births, there were fifty-five *less* than during 1879, and of living births, thirty-one less. There were in the whole number of births during 1880, four hundred and nineteen less than during the year 1878, and with one exception less than in any year since 1873. With an increase of population during these years of between twenty and twenty-five thousand, there must have been causes outside of natural causes, to have so largely lessened the ratio of births to population.

The number of marriages during 1880 was three hundred and seventy-three *larger* than during the previous year, and larger by one hundred and thirty-nine than in any other year during the whole period of registration.

Of deaths, there were recorded three hundred and fifty-seven *more* than during the previous year, the number being the largest ever recorded in any one year.

Table XIV presents the general results of registration in all of the towns in Rhode Island during the year 1880, together with the proportion of the several events of births, marriages and deaths to the population of each of the towns, by the census of the same year.

It is curious to note the great variableness of these proportions. In regard to births, the largest proportion to population occurring during 1880, was in the town of Bristol, that is, one birth in every 33.30 of the inhabitants, or about three and one-third per cent.; while in the town of North Smithfield, there was but one in every 147.00 persons, or about two-thirds of one per cent.

During the two preceding years, the town of East Providence reported the highest birth-rate: in 1879, one in every 30.09 and in 1878, the extraordinary proportion of one in every 26.12 persons.

Following Bristol in the order of highest birth-rate, are Middletown, one in every 39.28; Newport city, one in 39.32; Johnston, one in 39.49, and Providence city, one in every 39.92 persons.

On the other hand, following North Smithfield in exceptionally low birth-rates, are New Shoreham, one in every 120.40 persons; Jamestown, one in every 91.80; Charlestown, one in 85.92, and Little Compton, one in every 85.86 persons. The birth-rate in North

Smithfield during the year 1880, presents a strong contrast with that of 1879, when the birth rate was one in every 36.33 persons resident, or a proportion more than four times as large. For a period of ten years previous, the average proportion in that town was one in every 47 persons, and the low ratio of 1880 suggests defective registration.

In the counties, the proportions of the aggregate births to the aggregate population were as follows:

In Bristol County, one in every 40.00 persons; in Kent County, one in every 46.79; in Newport County, one in 44.86; Providence County, one in 42.92, and Washington County, one in every 52.56 persons.

For the whole State, the proportion was one birth in every 43.93 of the resident population.

The ratio of the number of persons married to population, is in every year more variable in the different towns than that of either births or deaths. The largest proportion to population of persons married in 1880, was, not according to the established rule, in the town of Foster, but in the town of Hopkinton, which recorded the large ratio of one person married in every 24.60 persons; the town of Foster following closely with a proportion of one person married in every 29.63 persons.

In these towns, a considerable number of the marriages have been of parties coming from another State, because of the greater facilities heretofore afforded in the accomplishment of the object.

The working of the new marriage law will doubtless lessen considerably the number of marriages in several of the border towns of the State.

There were no marriages recorded in the town of North Providence during the year 1880, a circumstance which will probably never again occur. Next to North Providence without a marriage record for the year, the town of Richmond follows with one person married in every 324.83 persons; Little Compton records one person married in every 200.33, and Cranston one in every 135.00 persons.

In the counties the proportions have considerable variation. They stand as follows :

Bristol County, one person married to every 58.73 persons resident; Kent County, one in every 47.42; Newport County, one in every 62.32; Providence County, one in every 49.10, and Washington County, one person married to every 45.72 of the population.

It will be observed that the proportions in the counties do not vary so greatly as in the towns, although the difference between Newport and Washington counties is quite considerable.

The returns from the towns, however, do not represent in every case the whole number of persons married during the year, who are

residents of those towns, many persons, for various reasons going into other towns for the purpose of receiving the service of the marriage ordinance.

Cranston, Johnston and North Providence, may be cited as instances of towns having a low marriage rate from that cause.

The maximum and minimum rates of mortality have seldom, if ever, varied so much as during the year 1880. From the very low rate of .44 in Jamestown, or less than four and one-half in each thousand of the population, to 2.46, or more than twenty-four and one-half in each thousand in Cranston is an extraordinary difference. It should be said, however, that deducting the deaths at the State Institutions in that town, the rate would be reduced nearly one-half, and stand lower than a considerable number of other towns in the State.

Following Cranston in the order of highest rates of mortality, are: West Greenwich, 2.26 or more than twenty-two and a half in each thousand; Bristol 2.01, or about twenty in each thousand; Providence city and Woonsocket, each, 1.98 or very nearly the same as Bristol, and Warren with a proportion of 1.92 or rather more than nineteen in each thousand.

The minimum rate of only one death in every 229.50 persons in Jamestown, is seldom paralleled anywhere. Following Jamestown, in the order of a low rate of mortality are: New Shoreham, .49 or less than five in each thousand, and South Kingstown with .78 per cent. of deaths, or less than eight in each thousand.

The proportions in Jamestown are precisely the same as in 1879.

It seems somewhat singular that the deaths reported in South Kingstown in 1880, should be scarcely half the proportion to the population, of those reported from the adjoining towns. It is to be hoped that the difference is not the result of proper attention to the canvass of the town, and especially as the returns generally have indicated a considerable improvement in the care and completeness of the work.

The following summary will show the rates of mortality in the cities and larger divisions of the State, and the whole State.

Bristol County.....	19.2 deaths in each thousand persons.
Kent County.....	14.9 deaths in each thousand persons.
Towns Newport County.....	12.6 deaths in each thousand persons.
City of Newport.....	15.4 deaths in each thousand persons.
Newport County.....	14.5 deaths in each thousand persons.
Towns of Providence County .....	17.0 deaths in each thousand persons.
City of Providence.....	19.8 deaths in each thousand persons.
Providence County.....	18.5 deaths in each thousand persons.
Washington County.....	12.7 deaths in each thousand persons.
Whole State.....	17.5 deaths in each thousand persons.

For the purpose of more ready comparison of the different events of births, marriages and deaths in the State during the year 1880, with those of the two preceding years, the following Table is introduced.

TABLE XV.

*Births, Marriages and Deaths in Rhode Island, in each of the three years 1878, 1879 and 1880.*

TOWNS AND DIVISIONS OF THE STATE.	Births in 1878.	Births in 1879.	Births in 1880.	Marriages in 1878.	Marriages in 1879.	Marriages in 1880.	Deaths in 1878.	Deaths in 1879.	Deaths in 1880.
Barrington.....	20	19	17	5	11	12	23	12	21
Bristol.....	139	135	181	51	40	30	85	82	131
Warren.....	79	86	80	48	43	55	85	56	77
BRISTOL COUNTY.....	258	240	278	104	94	97	193	150	219
Coventry.....	91	75	67	36	28	45	80	64	61
East Greenwich.....	52	56	53	30	36	43	40	42	53
West Greenwich.....	23	24	23	7	6	8	16	22	23
Warwick.....	284	277	297	73	101	121	152	183	160
KENT COUNTY.....	450	432	440	146	171	217	288	311	306
Jamestown.....	9	6	5	2	4	2	4	2	2
Little Compton.....	9	13	14	10	3	3	12	12	15
Middletown.....	22	26	29	6	2	6	13	15	16
New Shoreham.....	12	17	10	1	4	13	9	6	6
Portsmouth.....	28	30	32	5	9	11	20	22	26
Tiverton.....	67	48	50	17	25	36	18	38	42
TOWNS, NEWPORT COUNTY.....	157	140	140	41	47	71	76	95	107
NEWPORT CITY.....	476	303	399	127	122	123	223	264	243
Burrillville.....	130	138	125	34	30	42	66	76	106
Cranston.....	148	113	120	18	11	22	86	121	146
Cumberland.....	165	154	143	54	45	56	87	81	107
East Providence.....	166	168	124	19	27	40	90	93	77
Foster.....	22	25	22	42	43	26	16	23	21
Glocester.....	48	47	46	30	24	19	38	33	42
Johnston.....	135	129	146	27	22	22	46	46	81
Lincoln.....	335	283	299	54	75	90	206	190	188
North Providence.....	26	41	29	2	2	.....	14	12	16
North Smithfield.....	62	85	31	28	29	27	38	39	45
Pawtucket.....	528	483	404	168	172	204	332	319	351
Scituate.....	80	71	78	40	46	31	71	46	58
Smithfield.....	74	61	56	20	11	18	30	24	33
Woonsocket.....	404	370	371	147	160	187	287	273	318
TOWNS, PROVIDENCE COUNTY.....	2,323	2,268	1,964	663	697	784	1,411	1,377	1,588
PROVIDENCE CITY.....	2,585	2,522	2,626	1,016	1,071	1,231	1,969	2,026	2,060
Charlestown.....	14	15	13	7	7	13	15	17	15
Exeter.....	23	31	30	16	13	14	17	16	20
Hopkinton.....	65	55	62	41	41	60	47	26	34
North Kingstown.....	94	96	90	29	27	35	57	46	67
South Kingstown.....	106	100	88	39	39	36	47	59	40
Richmond.....	49	48	41	15	7	3	30	21	33
Westerly.....	114	100	104	60	60	85	48	64	77
WASHINGTON COUNTY.....	465	445	428	207	194	246	261	249	286
WHOLE STATE.....	6,714	6,350	6,295	*2,324	2,306	2,769	4,441	4,472	4,829

The diminution of births during the last three years, as shown in Table XV, will not fail to be noticed. It is evident that natural causes are not alone responsible.

Marriages have generally increased in number in proportion to increase of population, and deaths have increased in larger proportion in a majority of the towns, owing in part, doubtless, to causes previously alluded to.

The following Table is introduced in this Report, because it presents in a very concise manner the average relative percentages to population in the different towns, of the births, marriages and deaths, occurring therein for a series of ten years, and because it will doubtless fall under the eye of many persons to whom it may be of interest, and who have had no opportunity of examination in a previous Report. Diagrams are also introduced in this Report for the first time, to present the results shown in Table XVI in another way.



TABLE XVI.

*Showing the aggregate number of Births, Marriages and Deaths, in each town and in each county in the State, during the ten years from 1870 to 1880, with the annual average and percentage of the same events to the population; and the aggregate and average age of all the decedents in the same towns and counties for the same period of time.*

TOWNS AND DIVISIONS OF THE STATE.	Estimated Average Population, 1870 to 1880.	BIRTHS.			MARRIAGES.			DEATHS.			
		Whole No. Births, 10 years, 1870-1879.	Average to population one in every	Per cent.	Whole No. Marriages, 10 years, 1870-1879.	Average to population, married in every	Per cent.	Whole No. Deaths, 10 years, 1870-1879.	Average to population one in every	Per cent.	Aggregate Age of all.
Barrington.....	1,185	159	75.96	1.31	63	94.06	1.06	142	83.45	1.19	43.12
Bristol.....	5,859	1,738	33.54	2.98	405	71.96	1.39	904	64.37	1.55	31,334
Warren.....	4,005	724	55.32	1.81	436	45.93	2.18	656	61.05	1.64	31,968
BRISTOL COUNTY.....	11,019	2,018	42.09	2.38	904	60.95	1.64	1,702	64.74	1.54	57,434
Coventry.....	4,580	754	60.74	1.65	363	63.09	1.58	672	68.15	1.47	37,400
East Greenwich.....	3,120	629	49.60	2.02	305	51.15	1.90	500	63.40	1.63	30,063
West Greenwich.....	1,094	244	42.79	2.34	75	62.36	1.61	177	58.43	1.71	8,102
Warwick.....	11,614	2,498	46.49	2.15	1,068	54.11	1.85	1,461	70.49	1.36	43,589
KENT COUNTY.....	20,346	4,125	49.33	2.02	1,806	56.33	1.77	2,810	72.41	1.38	99,174
Jamestown.....	498	49	90.59	1.00	22	101.90	.98	43	116.19	.86	2,168
Little Compton.....	1,156	187	61.82	1.62	69	68.77	1.19	140	82.57	1.21	7,517
Middletown.....	1,074	195	55.06	1.89	49	109.56	.91	124	86.61	1.15	5,583
New Shoreham.....	1,147	208	55.15	1.81	80	71.99	1.39	111	108.33	.96	4,151
Portsmouth.....	1,893	255	74.23	1.35	96	98.59	1.01	216	87.64	1.14	10,231
Tiverton.....	2,101	470	44.67	2.24	269	39.05	2.56	285	73.73	1.36	13,271
TOWNS, NEWPORT CO.....	7,869	1,364	57.02	1.65	585	67.17	1.49	912	85.61	1.17	41,921
NEWPORT CITY.....	14,028	2,395	41.43	2.42	1,173	59.79	1.67	2,041	68.73	1.45	74,533
NEWPORT COUNTY.....	21,887	4,750	46.09	2.16	1,758	62.25	1.60	2,990	73.97	1.33	110,454

TOWNS AND DIVISIONS OF THE STATE.	Estimated Average Population, 1870 to 1880.	BIRTHS.		MARRIAGES.		DEATHS.						
		Whole No. Births, 10 years, 1870-1879.	Average to population, one in every	Per cent.	Whole No. Marriages, 10 years, 1870-1879.	Average to population one person married in every	Per cent.	Whole No. Deaths, 10 years, 1870-1879.	Average to population one in every	Per cent.	Aggregate Age of all.	Average Age of all.
Burrillville.....	5,249	1,140	46.05	2.17	820	82.02	1.22	677	77.53	1.29	23,966	38.96
Cranston.....	5,688	1,296	44.82	2.36	174	163.42	.61	1,045	54.43	1.82	39,417	37.72
Dunbarton.....	5,673	1,228	46.80	2.16	632	45.60	2.19	640	88.64	1.13	19,566	30.56
East Providence.....	4,836	1,038	43.23	2.31	593	82.41	1.21	593	73.94	1.36	16,730	28.36
Foster.....	1,548	218	72.78	1.37	293	32.69	3.06	151	102.80	.98	8,035	53.14
Glocester.....	4,098	421	49.83	2.01	294	44.83	2.23	335	62.08	1.61	15,062	34.93
Johnston.....	4,999	1,159	43.13	2.23	514	110.00	.90	745	67.10	1.49	23,047	30.94
Lincoln.....	11,835	2,928	35.61	2.30	514	101.36	.99	1,575	66.18	1.51	84,969	22.14
North Providence.....	2,705	191	40.92	2.44	87	108.50	.94	113	69.08	1.45	8,844	39.60
North Smithfield*.....	1,303	537	46.83	2.13	291	62.83	1.59	833	78.17	1.36	10,353	32.15
Pawtucket.....	18,464	4,194	44.77	2.33	1,449	68.84	1.46	2,692	89.49	1.13	61,754	40.80
Scituate.....	2,837	688	59.69	1.61	473	43.83	2.30	547	74.97	1.32	23,068	36.12
Smithfield.....	2,837	611	46.73	2.14	302	45.74	2.12	491	67.86	1.47	15,908	36.12
Woonsocket.....	13,576	3,741	36.29	2.76	1,522	47.86	2.09	2,633	51.66	1.92	64,332	24.49
TOWNS, PROVIDENCE Co.	84,949	18,264	46.67	2.14	7,382	57.77	1.73	18,440	62.66	1.59	391,875	29.15
PROVIDENCE CITY.....	88,358	23,950	37.00	2.70	10,399	42.48	2.35	17,587	50.94	1.99	468,265	27.76
PROVIDENCE COUNTY.....	194,924	42,214	43.81	2.28	17,631	52.80	1.90	31,027	59.60	1.67	860,131	28.37
Charlestown.....	1,054	172	60.92	1.64	70	75.99	1.33	151	69.80	1.42	798	51.33
Exeter.....	1,355	185	73.94	1.36	160	42.34	2.36	150	83.22	1.17	8,303	51.58
Hopkinton.....	2,700	604	48.69	2.19	309	63.66	1.57	392	70.41	1.43	15,983	40.78
North Kingstown.....	3,005	772	43.40	2.30	266	55.86	1.52	553	63.38	1.58	22,539	40.78
South Kingstown.....	4,240	974	43.63	2.29	273	56.84	1.77	608	70.43	1.41	26,464	43.99
Richmond.....	1,739	411	49.31	2.26	144	60.84	1.65	299	58.46	1.71	11,415	38.18
Westerly.....	5,406	945	57.23	1.73	635	42.58	2.35	603	59.68	1.11	20,897	34.66
WASHINGTON COUNTY.....	20,061	4,064	49.36	2.03	1,857	54.01	1.85	2,759	72.71	1.37	112,501	40.52
WHOLE STATE.....	958,239	58,771	44.75	2.23	24,006	53.79	1.86	41,257	62.59	1.59	1,365,994	30.63

\* Nine years. Organized March, 1871. † Six years. Divided May, 1874. ‡ Nine years. Divided March, 1871.

TABLE XVI.

*Showing the aggregate number of Births, Marriages and Deaths, in each town and in each county in the State, during the ten years from 1870 to 1880, with the annual average and percentage of the same events to the population; and the aggregate and average age of all the decedents in the same towns and counties for the same period of time.*

TOWNS AND DIVISIONS OF THE STATE.	Estimated Average Population, 1870 to 1880.	BIRTHS.		MARRIAGES.		DEATHS.						
		Whole No. Births, 1870-1879.	Average to population one in every	Per cent.	Whole No. Marriages, 1870-1879.	Average to population one person married in every	Per cent.	Whole No. Deaths, 1870-1879.	Average to population one in every	Per cent.	Aggregate Age of all.	Average Age of all.
Barrington.....	1,185	159	75.96	1.31	63	94.06	1.06	142	83.45	1.19	6,128	43.12
Bristol.....	5,829	1,738	33.54	2.96	405	71.96	1.39	904	64.87	1.55	31,324	34.66
Warren.....	4,005	724	55.33	1.81	436	45.98	2.18	656	61.05	1.64	20,977	31.98
BRISTOL COUNTY.....	11,019	2,618	43.09	2.38	904	60.95	1.64	1,702	64.74	1.54	57,434	33.77
Coventry.....	4,860	754	60.74	1.55	363	63.09	1.58	673	68.15	1.47	27,400	40.77
East Greenwich.....	3,120	629	49.60	2.02	305	51.15	1.96	500	62.40	1.63	20,083	40.17
West Greenwich.....	1,084	244	42.70	2.24	75	62.26	1.61	177	58.43	1.71	8,102	45.78
Warwick.....	11,614	2,498	46.49	2.15	1,063	54.11	1.85	1,461	79.49	1.36	43,589	29.15
KENT COUNTY.....	20,348	4,125	49.33	2.02	1,806	56.33	1.77	2,810	72.41	1.38	99,174	35.29
Janestown.....	488	49	90.59	1.00	22	101.90	.98	42	116.19	.86	2,168	51.62
Little Compton.....	1,156	187	61.82	1.62	69	83.77	1.19	140	82.57	1.31	7,517	53.69
Middletown.....	1,074	195	55.08	1.83	49	109.56	.91	124	86.61	1.15	5,593	45.08
New Shoreham.....	1,147	208	55.15	1.81	71	71.69	1.39	111	103.33	.96	4,151	37.30
Portsmouth.....	1,863	253	74.23	1.35	96	98.59	1.01	216	87.64	1.14	10,231	47.32
Tiverton.....	2,101	470	44.67	2.24	269	39.05	2.56	285	73.73	1.36	12,271	43.06
TOWNS, NEWPORT Co....	7,859	1,364	57.63	1.55	585	67.17	1.49	912	85.61	1.17	41,921	45.66
NEWPORT CITY.....	14,098	3,396	41.43	2.42	1,173	59.79	1.67	2,041	68.73	1.45	74,533	36.51
NEWPORT COUNTY.....	21,987	4,760	46.09	2.16	1,768	62.25	1.60	2,959	73.97	1.35	116,454	30.35

TOWNS AND DIVISIONS OF THE STATE.	Estimated Average Population, 1870 to 1880.	BIRTHS.		MARRIAGES. <sup>1</sup>		DEATHS.		
		Whole No. Births, 1870-1879.	Average to population one in every	Per cent.	Whole No. Marriages, 1870-1879.	Average to population one person married in every	Per cent.	Whole No. Deaths, 1870-1879.
Burrillville.....	5,249	1,140	46.05	2.17	280	82.02	1.23	677
Cranston.....	5,688	1,286	44.23	2.36	174	163.42	.61	1,045
Cumberland.....	5,673	1,228	46.30	2.16	622	45.60	2.19	640
East Providence.....	4,836	1,003	43.23	2.21	593	82.41	1.21	593
Foster.....	1,543	213	72.78	1.37	286	32.69	3.06	151
Glocester.....	2,098	491	49.83	2.01	224	44.88	2.23	335
Johnston.....	4,999	1,159	43.13	2.22	228	110.00	.90	745
Lincoln*.....	11,565	2,923	33.61	2.80	514	101.35	.99	1,575
North Providence.....	1,803	191	40.92	2.44	37	106.50	.94	113
North Smithfield*.....	2,797	537	46.88	2.13	221	62.83	1.59	323
Pawtucket.....	18,464	4,124	44.77	2.23	1,849	66.34	1.46	823
Scituate.....	4,101	688	59.62	1.61	473	43.33	2.30	547
Smithfield.....	2,357	611	46.76	2.14	309	45.74	2.13	431
Woonsocket.....	13,576	8,741	36.39	2.76	1,522	47.88	2.09	2,628
TOWNS, PROVIDENCE Co.	84,249	18,264	46.57	2.14	7,282	57.77	1.73	13,440
PROVIDENCE CITY.....	88,358	23,960	37.00	2.70	10,399	42.48	2.35	17,357
PROVIDENCE COUNTY.....	184,924	42,214	43.81	2.28	17,681	52.30	1.90	31,097
Charlestown.....	1,064	173	60.92	1.64	70	75.29	1.33	151
Exeter.....	1,355	185	73.24	1.36	160	42.34	2.36	150
Hopkinton.....	2,760	604	45.69	2.19	309	63.60	1.57	392
North Kingstown.....	3,505	773	45.40	2.20	296	65.85	1.53	553
South Kingstown.....	4,240	974	43.53	2.29	373	56.84	1.77	608
Richmond.....	1,739	411	49.31	2.36	144	60.38	1.65	299
Westerly.....	5,408	945	57.23	1.73	635	42.58	2.35	608
WASHINGTON COUNTY.....	20,061	4,064	49.36	2.03	1,867	54.01	1.85	2,759
WHOLE STATE.....	283,239	58,771	44.75	2.23	24,006	53.79	1.86	41,237

\* Nine years. Organized March, 1871. † Six years. Divided May, 1874. ‡ Nine years. Divided March, 1871.

TABLE XVI.

*Showing the aggregate number of Births, Marriages and Deaths, in each town and in each county in the State, during the ten years from 1870 to 1880, with the annual average and percentage of the same events to the population; and the aggregate and average age of all the decedents in the same towns and counties for the same period of time.*

TOWNS AND DIVISIONS OF THE STATE.	Estimated Average Population, 1870 to 1880.	BIRTHS.			MARRIAGES.			DEATHS.				
		Whole No. Births, 10 years, 1870-1879.	Average to population one in every	Per cent.	Whole No. Marriages, 10 years, 1870-1879.	Average to population one person married in every	Per cent.	Whole No. Deaths, 10 years, 1870-1879.	Average to population one in every	Per cent.	Aggregate Age of all.	Average Age of all.
Barrington.....	1,185	159	75.96	1.31	63	94.06	1.06	142	83.45	1.19	6,123	43.12
Bristol.....	5,829	1,738	33.54	2.96	405	71.96	1.39	904	64.37	1.55	31,394	34.66
Warren.....	4,005	724	55.32	1.81	436	45.98	2.18	656	61.05	1.64	30,977	31.96
BRISTOL COUNTY.....	11,019	2,618	43.09	2.38	904	60.95	1.64	1,702	64.74	1.54	57,434	33.77
Coventry.....	4,890	754	60.74	1.65	363	63.09	1.56	673	68.15	1.47	27,400	40.77
East Greenwich.....	3,120	629	49.60	2.02	306	51.15	1.96	500	62.40	1.63	30,083	40.17
West Greenwich.....	1,034	244	42.79	2.34	75	62.36	1.61	177	58.43	1.71	8,102	45.78
Warwick.....	11,614	2,498	46.49	2.15	1,063	54.11	1.85	1,461	79.49	1.36	48,589	39.15
KENT COUNTY.....	30,348	4,125	49.33	2.02	1,806	56.33	1.77	2,810	72.41	1.38	99,174	36.39
Janestown.....	488	49	90.59	1.00	22	101.90	.98	43	116.19	.86	2,168	51.62
Little Compton.....	1,156	187	61.82	1.62	69	83.77	1.19	140	82.57	1.31	7,517	53.69
Middletown.....	1,074	196	55.08	1.83	134	109.56	.91	124	86.61	1.15	5,363	45.08
New Shoreham.....	1,147	308	55.15	1.81	80	71.69	1.39	111	108.33	.96	4,151	37.39
Portsmouth.....	1,868	255	74.32	1.35	96	98.59	1.01	216	87.64	1.14	10,331	47.82
Tiverton.....	2,101	470	44.67	2.24	269	39.05	2.56	285	73.73	1.36	12,371	48.05
TOWNS, NEWPORT Co....	7,869	1,364	57.62	1.55	585	67.17	1.49	912	85.61	1.17	41,921	45.66
NEWPORT CITY.....	14,028	3,386	41.43	2.42	1,173	59.79	1.67	2,041	68.73	1.45	74,539	36.51
NEWPORT COUNTY.....	21,467	4,750	46.09	2.16	1,758	62.35	1.60	2,960	73.97	1.35	116,454	39.35

TOWNS AND DIVISIONS OF THE STATE.	Estimated Average Population, 1870 to 1880.	BIRTHS.		MARRIAGES.*		DEATHS.		
		Whole No. Births, 1870-1879.	Average to population one in every	Per cent.	Whole No. Marriages, 1870-1879.	Average to population one person married in every	Per cent.	Whole No. Deaths, 1870-1879.
Burrillville.....	5,249	1,140	46.05	2.17	390	82.02	1.22	677
Cranston.....	5,698	1,286	44.23	2.36	174	103.42	.61	1,045
Cumberland.....	5,673	1,228	46.30	2.16	622	45.60	2.19	640
East Providence.....	4,336	1,003	43.23	2.31	393	82.41	1.21	592
Foster.....	1,543	213	73.78	1.87	296	32.69	3.06	151
Glocester.....	2,098	481	49.83	2.01	234	44.88	2.23	335
Johnston.....	4,999	1,159	43.13	2.22	328	110.00	.90	745
Lincoln.....	11,365	2,923	35.61	2.80	514	101.35	.99	1,575
North Providence.....	1,303	191	40.93	2.44	87	106.50	.94	113
North Smithfield.....	2,797	537	46.88	2.13	321	62.83	1.59	322
Pawtucket.....	18,464	4,184	44.77	2.23	1,349	66.34	1.46	822
Scituate.....	4,101	688	59.62	1.61	473	43.33	2.30	547
Smithfield.....	2,867	611	46.76	2.14	309	45.74	2.12	431
Woonsocket.....	13,575	3,741	36.29	2.76	1,532	47.86	2.09	9,626
TOWNS, PROVIDENCE Co.	84,349	18,364	46.67	2.14	7,282	57.77	1.73	13,440
PROVIDENCE CITY.....	88,358	23,950	37.00	2.70	10,399	42.48	2.35	17,587
PROVIDENCE COUNTY.....	184,924	42,214	43.81	2.28	17,681	52.30	1.90	31,027
Charlestown.....	1,054	173	60.92	1.64	70	75.29	1.33	151
Exeter.....	1,355	186	73.24	1.86	160	42.34	2.36	150
Hopkinton.....	2,760	604	45.69	2.19	309	63.60	1.57	392
North Kingstown.....	3,505	773	45.40	2.20	296	65.88	1.52	553
South Kingstown.....	4,240	974	43.53	2.39	373	56.84	1.77	608
Richmond.....	1,739	411	42.31	2.36	144	60.38	1.65	299
Westerly.....	5,408	945	57.23	1.73	635	42.58	2.35	603
WASHINGTON COUNTY.....	20,061	4,064	49.36	2.03	1,897	54.01	1.85	9,759
WHOLE STATE.....	256,239	58,771	44.75	2.23	24,006	53.79	1.86	41,257

\* Nine years. Organized March, 1871. † Six years. Divided May, 1874. ‡ Nine years. Divided March, 1871.

In Table XVI., will be found the aggregate number of births, marriages and deaths that occurred in each of the several towns of the State, during a period of ten years, with the annual average to the population, and average percentage of the same.

In the division of deaths, there will also be found the aggregate age of all the decedents in each of the towns, during the same period, and the average age of all.

The population of the State has been gradually, though not rapidly, increasing, in nearly all of the towns, and has therefore changed more or less in numbers in each of them, during the period of ten years. It was, therefore, desirable to ascertain, as far as possible, the average population of each of the towns during the period of time taken, for the purpose stated. Upon finding the average population of several towns, it was seen that the number was near the population by the Census of 1875, and the number by that Census presenting an approximate mean sufficiently near for all practical purposes, it was therefore adopted as a basis for the averages and percentages of the same, with few exceptions.

The exceptions of towns to the whole number of ten years in the preceding Table, are: Lincoln, North Smithfield and Smithfield, which were organized as at present constituted in 1871, and therefore cover a period of nine years, and North Providence, which was divided in 1874, and covers a period of six years only. Providence had a considerable accession of population from North Providence, in 1874, which has been taken into account in the estimated average.

It will be seen upon an examination of Table XVI., that the proportions of the average number of each of the several classes of events to the population of the towns and sections where they occur, vary very considerably even in a long series of years, though very much less than during single years.

It will also be noticed that the larger the population, the more uniform, as a rule, will be the percentages, especially of births and deaths. The aggregation of the town populations into counties is an example.

#### BIRTHS.

In the division of births, it will be found that the average proportion of that class of events, to the population, varies from one birth in every 33.54 persons, or nearly three per cent., in Bristol, to one birth in every 99.59 persons, or about one per cent., in Jamestown.

The towns having an exceptionally high birth rate, following Bristol, are: Lincoln, one birth in every 35.61 persons; Woonsocket, one in every 36.29; North Providence, one in every 40.92 persons.

Following Jamestown, the towns having a noticeably low birth rate,

are: Barrington, one birth in every 75.96 persons; Portsmouth, one in every 74.22; Exeter, one in every 73.24; and Foster, one in every 72.78 persons.

Among the larger aggregate populations of the State, Providence city and Bristol county show the largest proportion of births to population; that is, Providence one in every 37 persons, or 2.70 per cent., and Bristol county one in every 42.00 persons, or 2.38 per cent.

The towns of Providence county show an average birth rate of one to every 46.67 persons, or 2.14 per cent.; Washington county, one in every 49.36 persons, or 2.03 per cent.; and Kent county, one in every 49.33, or 2.02 per cent.

In Newport county towns, the birth rate is one birth in every 57.62 of the population, or 1.65 per cent., while in Newport city, the proportion is one in every 41.43 persons, or 2.42 per cent. The difference of birth rates between the towns of Newport county and the city of Newport, for the term of ten years, is rather less than for the last five years.

In Newport county, the average proportion is one birth in every 46.09 persons, or 2.16 per cent., and in Providence county, one in every 43.81, or 2.28 per cent.

The annual average for the whole state is one in every 44.75 persons, or 2.23 per cent of the population.

#### MARRIAGES.

For various obvious reasons, the marriage rates of the different towns present very much less uniformity than those of either births or deaths. The proportions vary from one person married in every 32.69 of the population, or 3.06 per cent., in Foster, to one person married in every 163.42 persons, or 0.61 per cent., in Cranston—a difference of more than five to one.

The towns having an unusually high marriage rate, following Foster, are: Tiverton, with an average annual rate of one person married in every 39.05 of the population, or 2.56 per cent.; Exeter, 2.36 per cent.; Westerly, 2.35 per cent.; and Gloucester, 2.23 per cent.

At the other extreme, following Cranston, are: Johnston, with one person married in every 110.00 persons, or .90 per cent.; Middletown, .91 per cent.; and North Providence, Jamestown and Lincoln, each falling short of one per cent. of the population in the annual average.

In the counties, the ratios of persons married, to the population, are seen to be much more uniform. The percentages are as follows: Bristol county, 1.64 per cent.; Kent county, 1.77 per cent.; Newport county, 1.60 per cent.; Providence county, 1.90 per cent.; and Washington county, 1.85 per cent.



In the whole State, for the period of ten years, the annual average is one person married to every 53.79 persons, or 1.86 per cent.

#### DEATHS.

The greatest mortality, in proportion to population, is found in the city of Providence, with an annual average of one decedent to every 50.24 persons, or 1.99 per cent.; following which is the town of Woonsocket, with an annual average of one decedent in every 51.66 of the population, or 1.92 per cent. Following Woonsocket in the bad eminence of a high death rate, are: Cranston, with the average annual ratio of 1.82 per cent.; Richmond and West Greenwich, 1.71 per cent. each. For the period of ten years, no town in the State shows an average annual death rate as high as two per cent., the city of Providence however falling short by only a small fraction.

The minimum ratio of mortality to population, is found in the town of Jamestown, with one decedent to every 116.19 persons, or 0.86 per cent. Jamestown, it will be remembered, had also the minimum percentage of births.

As a rule, it will be found that a high birth rate in any town will also be attended by a high death rate. The reason will be obvious, when it is remembered that of every 100 children born in the State of Rhode Island, during the last twenty-five years, 35 have ceased to exist at the end of five years.

Next to Jamestown, the towns showing a low rate of mortality, are: New Shoreham, one decedent in every 103.33 persons, or 0.96 per cent., and Foster, one in every 102.20 persons, or 0.98 per cent.

Newport city shows an average annual mortality of 14.5 in each one thousand, and Providence city, 19.9 in each one thousand.

In the counties, the ratios of mortality are as follows:

Bristol County.....	15.4 in each one thousand.
Kent County.....	13.8 in each one thousand.
Newport County.....	13.5 in each one thousand.
Providence County.....	16.7 in each one thousand.
Washington County.....	13.7 in each one thousand.
Whole State....	15.9 in each one thousand.

There is a small relative loss in the State in leaving out the decedents in North Providence previous to 1874, and it cannot be said that the estimated average population is absolutely exact within a score of persons, but it will be admitted that the numbers taken are sufficiently approximate for relative comparisons, and all other practical purposes.

In order to facilitate comparisons of the average percentages to the

population, of the births, marriages and deaths in the different counties of Rhode Island, and also the State, during the period of ten years from 1870 to 1879, inclusive, the following synopsis is presented:

	Births, one in every	Marriages, one person married in every.	Deaths, one in every
Bristol County.....	42.09	60.95	64.74
Kent County.....	49.83	56.83	73.41
Newport County.....	46.09	62.25	73.97
Providence County.....	43.81	52.30	59.00
Washington County.....	49.86	54.01	73.71
Whole State.....	44.75	58.79	62.59

It may be of interest to contrast the births, on the basis of each 100 of the same, during the last ten years, with the number of persons married, and with the number of deaths for the same period, in each of the larger divisions of the State, and in the whole State.

In Bristol county, the aggregate of births for the period named, was 2,618; number of persons married, 1,808; number of deaths 1,702. The proportions, therefore stands as follows: For every 100 births there were 65.01 deaths, and 34.50 marriages, or 69.00 persons married.

In Kent county, the aggregates were: Births, 4,125; marriages, 1,806; deaths, 2,810. The proportions are as follows: For every 100 births there were 43.78 marriages, or 87.56 persons married, and 68.12 persons died.

In Newport county there were 4,750 births, 1,758 marriages, and 2,959 deaths. The ratio for every 100 births, 37.16 marriages, or 74.23 persons married, and 62.30 persons died.

In Providence county there were 42,214 births, 17,681 marriages, and 31,027 deaths. For every 100 births there were 41.88 marriages, or 83.77 persons married, and 73.50 deaths.

In Washington county there were 4,064 births, 1,857 marriages, and 2,759 deaths. For every 100 births there were 45.69 marriages, or 91.38 persons married, and 67.90 persons died.

In the whole State, for the same period, there were 58,771 births, 24,006 marriages, or 48,012 persons married, and 41,257 persons died. The proportions for the whole State are, therefore, for every 100 births there were 40.84, marriages, or 81.69 persons married, and 70.20 persons died.

The following recapitulatory summary will present the foregoing remarks more concisely and clearly.

		Persons married.	Deaths.
Bristol County	To every 100 births there were	69.00	65.01
Kent County	To every 100 births there were	87.56	68.12
Newport County	To every 100 births there were	74.23	62.40
Providence County	To every 100 births there were	68.77	73.50
Washington County	To every 100 births there were	91.38	67.90
Whole State	To every 100 births there were	81.69	70.20

## AVERAGE AGE.

It will be borne in mind, that the circumstance of average individual longevity, in any town or division of the State is not dependent on the relative healthfulness of the location. The surroundings must be necessarily salubrious to promote length of life; but the character of the habitations, the home methods of living, dietetic and otherwise, the public habits and customs, the average intelligence, industry and morality of the populace, are potent factors of the length or brevity of life.

Then the circumstance of slow increase of population, owing to the departure, at an early age, of a large proportion of the population to engage in the active occupations of life, in other localities, and leaving but a meagre percentage of young adults to establish families, in the child bearing period of life, and the necessary corollary of a diminished percentage of births, of which about 35 in each 100 would be expected to have ceased to exist at the expiration of the fifth year, thus *lowering* the average age in towns having a high birth rate, and *raising* it in towns having a low birth rate.

It will, therefore, be understood that to obtain a fairly approximate knowledge of the relative healthfulness of the towns, and consequent relative longevity of the inhabitants of each, the various circumstances alluded to above must be taken into consideration.

Upon consultation of Table XVI., it will be seen that the maximum average age of all the decedents during the last ten years, was in the town of Charlestown; that is, 54.33 years. The minimum average age of the whole number of decedents, for the same period, was in the town of Lincoln; that is, 22.14 years.

It will be noticed that the birth rate in Charlestown is but little more than half that of Lincoln, and a reasonable inference would be that the higher average age at death in Charlestown was owing, in great part at least, to the absence of a large proportional number of that class which is peculiarly subject to fatal diseases at an early age.

Following Charlestown, in presenting an advanced average age at the time of decease, are: Little Compton, 53.69 years; Foster, 53.14 years; Jamestown, 51.62 years; Exeter, 51.58 years.

Of the minimum average age, next to Lincoln, are: Woonsocket,

24.49 years; Providence city, 27.76 years; East Providence, 28.26 years; Pawtucket, 29.81 years.

The following summary will show the average age of decedents in the different counties and in the whole State:

Bristol County.....	Average age at death 33.77 years.
Kent County.....	Average age at death 35.29 years.
Newport County.....	Average age at death 39.35 years.
Providence County.....	Average age at death 28.37 years.
Washington County....	Average age at death 40.52 years.
Whole state.....	Average age at death 30.68 years.

TABLE XVII.

*Showing the proportions of Births, Marriages and Deaths, to the population, in the aggregate for the whole State, in each of the last eleven years.*

YEARS.	BIRTHS.		MARRIAGES.		DEATHS.		
	Number.	To population one birth in	Number.	Of population one person married in	Number.	Of population one death in	Deaths in each 100 of the population.
1869.....	5,245	41.4	2,289	47.5	3,382	64.2	1.56
1870.....	5,215	41.7	2,362	46.0	3,238	67.1	1.49
1871.....	5,678	38.2	2,336	46.5	3,344	65.0	1.54
1872.....	6,143	35.4	2,537	42.9	4,247	51.2	1.95
1873.....	6,022	36.1	2,630	41.3	4,403	49.4	2.03
1874.....	6,466	39.9	2,541	50.8	4,229	61.1	1.64
1875.....	6,508	39.7	2,485	52.0	4,317	59.8	1.67
1876.....	6,329	40.8	2,253	57.3	4,116	62.7	1.59
1877.....	6,335	41.4	2,282	56.6	4,450	58.0	1.72
1878.....	6,714	38.5	2,324	55.7	4,441	58.1	1.72
1879.....	6,350	43.6	2,306	57.8	4,472	61.9	1.60
1880.....	6,205	43.9	2,769	49.9	4,829	57.3	1.75

It will be seen by the above Table, that the number of births recorded in the State during the year 1880, was less by 55 than during the preceding year, and less by 419 than in 1878.

The difference between the numbers reported in 1878 and 1880 is

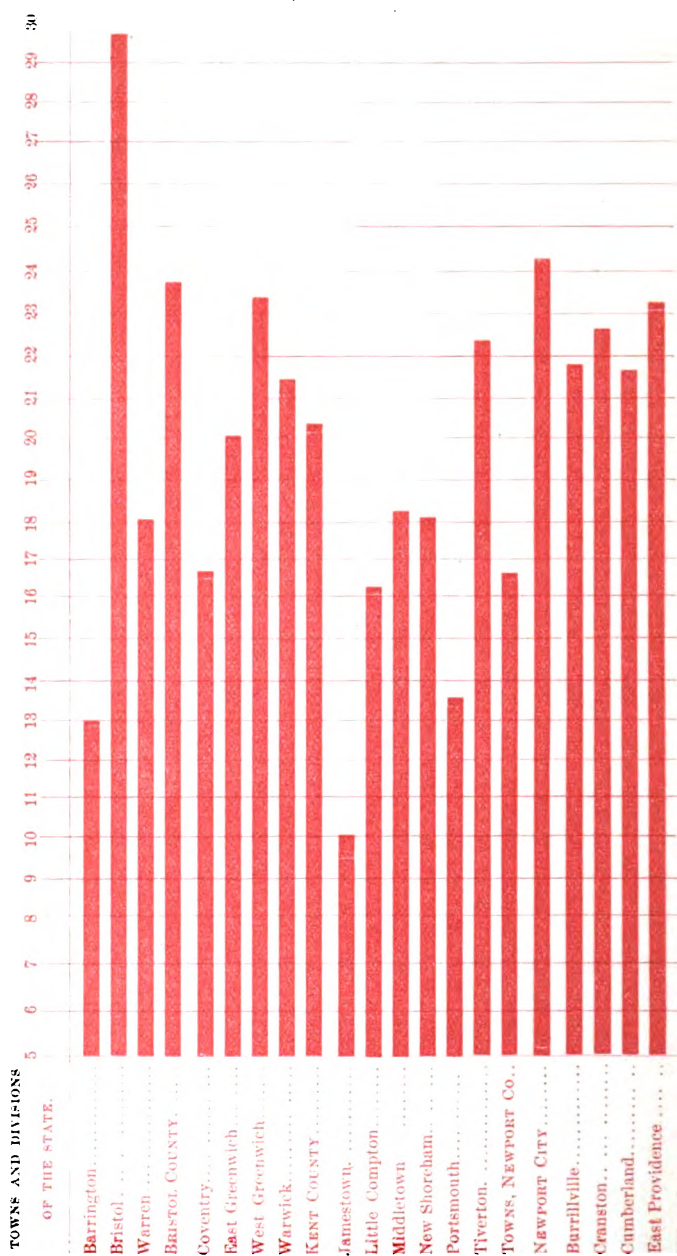
not greater than has occurred before, and considerable fluctuation may be considered the rule.

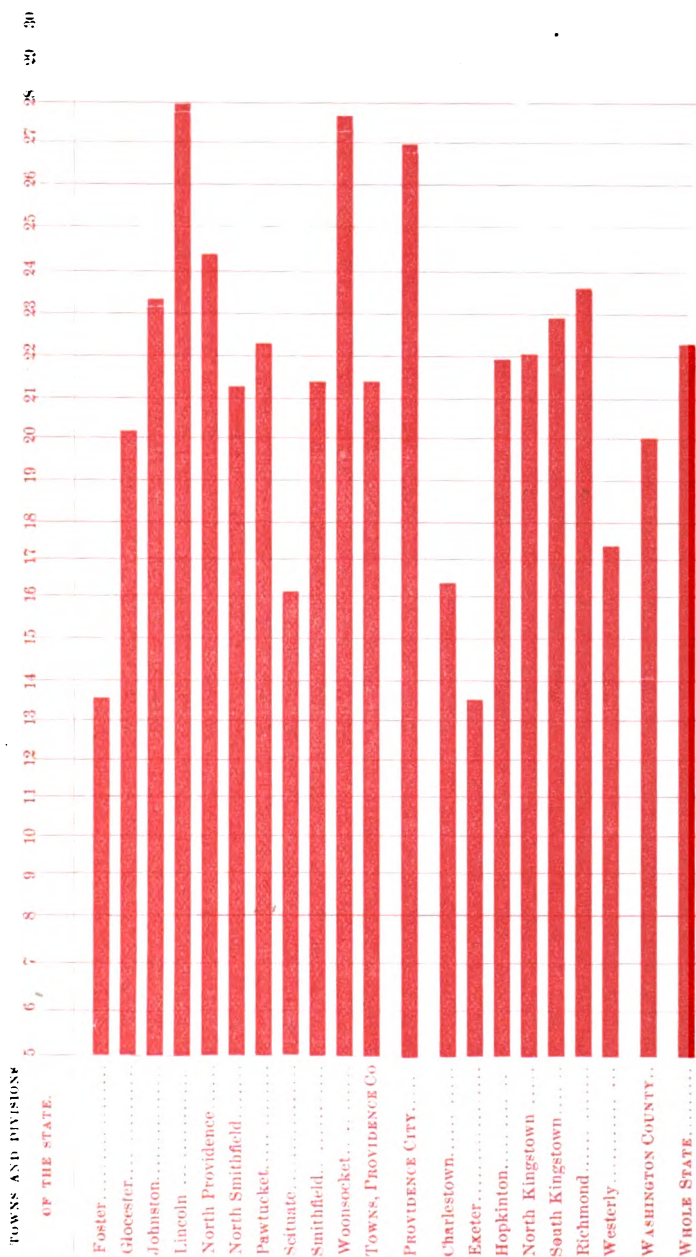
The proportion of births to population, in the whole State, according to the Census of 1880, is one to every 43.9, or about 2.3 per cent. The proportion of one birth in every 38.5 as given in the Report for 1878, was based upon the State Census of 1875, and, as then stated, was larger than the actual population at the time would warrant.



## BIRTH RATE.

Diagram showing the annual average of births in each town of the population in each town in the State, during the period of ten years, from 1870 to 1879, inclusive.





The figures at the top of the perpendicular lines indicate, in whole numbers, the average of births each year in every 1000 persons. The spaces are fractional parts of one. For instance, the heavy horizontal line against Barrington reaches to the perpendicular line 13. It shows the birth rate of Barrington to be about 13 in each 1000.

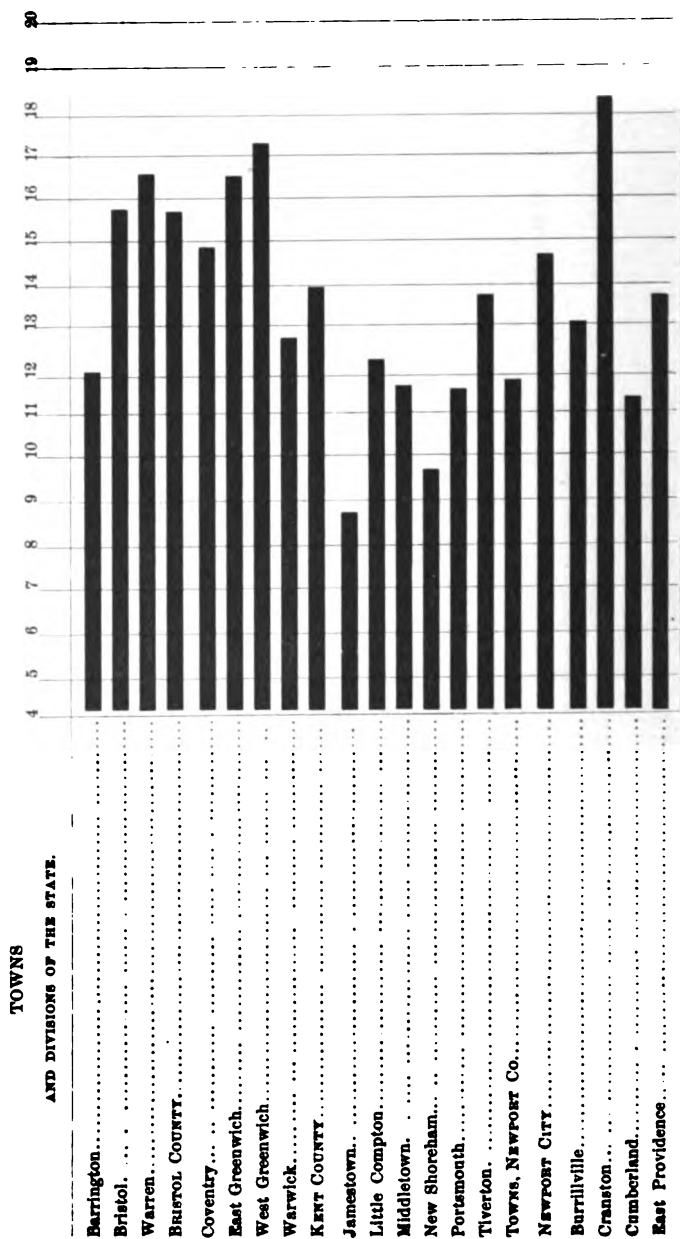






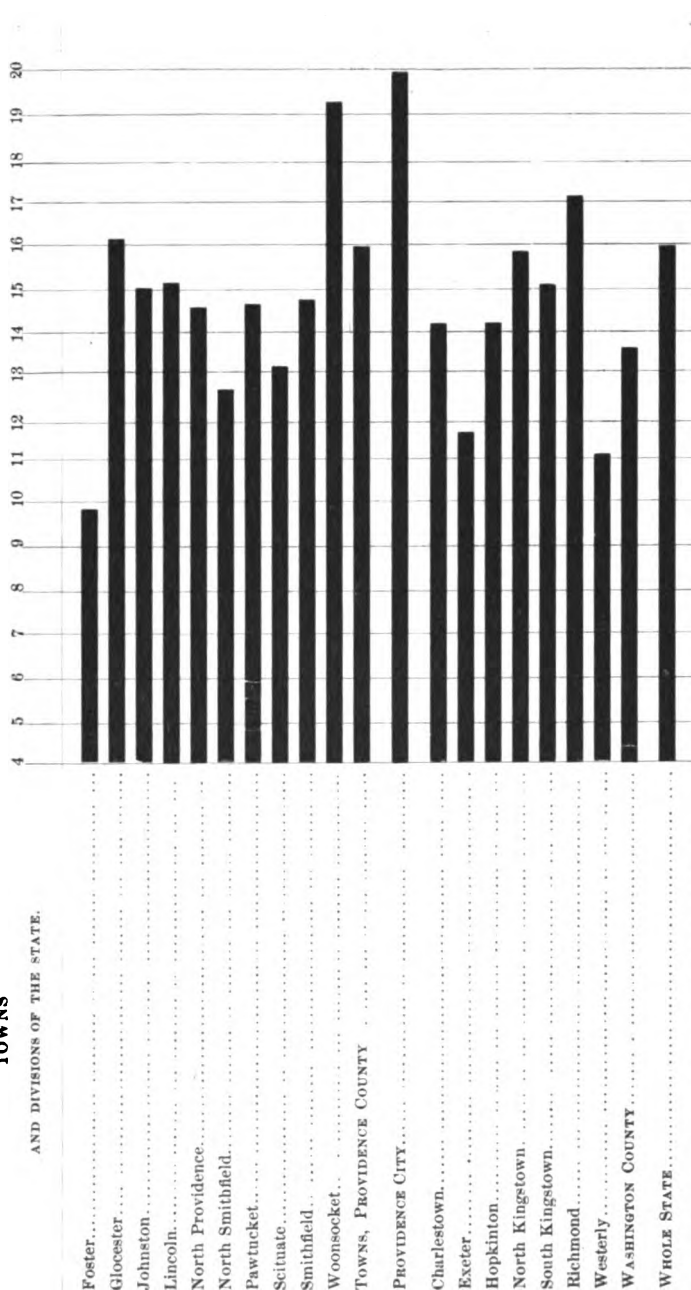
## DEATH RATE.

Diagram showing the annual average of deaths in each 1000 of the population in each town in the State, during the period of ten years, from 1870 to 1879, inclusive.



## TOWNS

AND DIVISIONS OF THE STATE.



The figures at the top of the perpendicular lines indicate, in whole numbers, the average of deaths each year in every 1000 persons. The spaces are fractional parts of one. For instance, the heavy horizontal line against Barrington reaches to the perpendicular line 12. It shows the average annual death rate of Barrington was about 12 in each 1000.



## BIRTHS, 1880.

The general statistics of births in Rhode Island during the year 1880, derived from the returns sent to this office, may be found on pages 2 to 6 inclusive, in Tables I, II and III.

The whole number reported is 6,295, and as before stated, is 55 less than that of 1879.

### SEX OF THE CHILDREN BORN.

Of the 6,295 children whose births were reported in 1880, there were 3,241 males and 3,054 females. This gives 104.8 males to each 100 females, or 51.48 males and 48.52 females in each 100 children.

The following recapitulatory Table shows the numbers and sex, and the proportions of each sex of the children born in Rhode Island, in each of the last twenty-seven years:

TABLE XVIII.

Years.	Males.	Females.	Males to each		Males.	Females.
			100 Females.			
1854.....	1,081.....	1,008.....	107.8, or.....		51.87 and 48.13	in each 100
1855.....	1,492.....	1,421.....	105 0, or.....		51.22 and 48.78	in each 100
1856.....	1,479.....	1,407.....	105.1, or.....		51.25 and 48.75	in each 100
1857.....	2,057.....	1,948.....	105.6, or.....		51.36 and 48.64	in each 100
1858.....	2,900.....	2,053.....	107.2, or.....		51.73 and 48.27	in each 100
1859.....	2,909.....	2,097.....	105.3, or.....		51.30 and 48.70	in each 100
1860.....	2,363.....	2,212.....	102.3, or.....		50.57 and 49.43	in each 100
1861.....	2,531.....	2,291.....	110.5, or.....		52.49 and 47.51	in each 100
1862.....	2,152.....	1,967.....	109.4, or.....		52.25 and 47.75	in each 100
1863.....	1,892.....	1,288.....	105.8, or.....		51.41 and 48.59	in each 100
1864.....	1,949.....	1,942.....	100.3, or.....		50.09 and 49.91	in each 100
1865.....	2,096.....	1,857.....	112.9, or.....		53.02 and 46.98	in each 100
1866.....	2,546.....	2,356.....	108.0, or.....		51.94 and 48.06	in each 100
1867.....	2,665.....	2,464.....	107.0, or.....		51.87 and 48.13	in each 100
1868.....	2,745.....	2,627.....	104.5, or.....		51.10 and 48.90	in each 100
1869.....	2,685.....	2,560.....	104.9, or.....		51.19 and 48.81	in each 100
1870.....	2,679.....	2,536.....	105.6, or.....		51.37 and 48.63	in each 100
1871.....	2,878.....	2,800.....	102.8, or.....		50.69 and 49.31	in each 100
1872.....	3,085.....	3,058.....	100.9, or.....		50.22 and 49.78	in each 100
1873.....	3,135.....	2,887.....	108.6, or.....		52.06 and 47.94	in each 100
1874.....	3,311.....	3,155.....	104.9, or.....		51.21 and 48.79	in each 100
1875.....	3,362.....	3,146.....	106.9, or.....		51.66 and 48.34	in each 100
1876.....	3,391.....	3,038.....	108.3, or.....		52.00 and 48.00	in each 100
1877.....	3,163.....	3,072.....	103.0, or.....		50.73 and 49.27	in each 100
1878.....	3,402.....	3,312.....	102.7, or.....		50.67 and 49.33	in each 100
1879.....	3,359.....	3,091.....	105.4, or.....		51.22 and 48.68	in each 100
1880.....	3,241.....	3,054.....	106.8, or.....		51.48 and 48.52	in each 100

The number of children whose births were recorded in 1880, were not only less than in the preceding year, but also less than in any preceding year since 1873, with the exception of 1877, when the slightly smaller number was of the male sex only. The number of male children born in 1880 was 18 less than in 1879, and 161 less than in 1878. The number of female children in same year was 37 less than in 1879, and less than in any preceding year since 1876.

#### PROPORTION OF THE SEXES.

The proportion of each sex to the whole number varies more or less every year, as might reasonably be expected.

In Table II, on pages four and five, may be found the number of the children born in the different divisions of the State during the year, and in the several months of the year, with the number of each sex respectively.

The following Table will present, in a more concise manner, the whole number of children of each sex in each division, whose births were recorded during 1880.

TABLE XIX.

BIRTHS, 1880.	Bristol County.	Kent County.	Newport County, Towns.	Providence County, Towns.	Washington County.	Newport City.	Total.	Providence City.	Whole State.
Males.....	150	231	81	1,004	209	305	1,880	1,361	3,341
Females.....	128	309	59	980	219	194	1,789	1,365	3,054
Total.....	278	440	140	1,984	428	399	3,669	2,626	6,295
Males to each 100 Females..	117.2	110.5	137.8	102.4	95.4	105.6	105.1	107.6	105.1

There has been no year during the whole period of registration in which the number of male children born during the year has not exceeded the number of female children born during the same time.

This is shown very clearly in Table XVIII. In 1865 the proportion was 112.9 males to each 100 females, or about 53 males and 47 females in each 100 births, an excess of 60 males in each thousand births.

In 1880, the male children born were in excess in every county except Washington, and also in excess in the cities of Providence and Newport.

The proportions however vary considerably. In Bristol County the males were 117.2 to each 100 females, while in Washington County the males were only .95 to each 100 females; Kent County shows a

proportion of 110.5 males, and Newport County Towns 137.3 males to each 100 females.

The larger the population, the less will be the variation from year to year. In the city of Providence and in the whole State, the variations have, with one or two exceptions, scarcely exceeded three or four in a hundred within the last twenty-eight years.

The proportions in the whole State for 1880, were 106.1 males to each 100 females; in the city of Providence, 107.6 males, and in the State, excluding Providence, 105.6 males to each 100 females.

#### PROPORTION OF THE SEXES.

##### *Contrast of the city of Providence with the rest of the State.*

In order to illustrate the difference, if any exist, between city life, and village and country life, as found in Rhode Island, a comparison of the statistics of births in the city of Providence, with those reported from the rest of the State, will be presented.

These comparisons would hardly be a fair test of the influences of city life, as they might be found in cities less favored than the city of Providence, in regard to location, and other circumstances and conditions favorable to health, and a purely country life.

There are several large and many small villages in the State, and parts of the city of Newport, where may be found existing all the conditions contributing to either temporary physical or mental exaltation, or final mental and physical degeneration, almost, if not quite as largely as any locations in the city of Providence.

The whole number of births in the city of Providence during the year 1880 was 2,626, of which 1,361 were males, and 1,265 were females. The proportion of males to females would, therefore, be as follows: 107.6 males to each 100 females, or 51.82 males and 48.18 females in each 100 children born.

In the rest of the State, during the same year, the whole number of children born was 3,669, of which 1,880 were males, and 1,789 were females, or 51.24 males and 48.76 females in each 100 births.

The following shows the proportion of the sexes of the children born in Providence, and in the rest of the State, during the years 1878, 1879 and 1880; and also in the twenty-five years from 1854 to 1878, inclusive:

1878.

	Males.	Females.	Males to each	
			100 Females.	Males. Females.
Providence City.....	1,335.....	1,350.....	106.8, or .....	51.64 and 48.36 in each 100.
Rest of the State.....	2,067.....	2,062.....	100.2, or .....	50.06 and 49.94 in each 100.



## 1879.

	Males to each			
	Males.	Females.	100 Females.	Males. Females.
Providence City.....	1,297.....	1,325.....	105.7, or.....	51.43 and 48.57 in each 100.
Rest of the State.....	1,962.....	1,866.....	105.1, or.....	51.25 and 48.75 in each 100.

## 1880.

	Males to each			
	Males.	Females.	100 Females.	Males. Females.
Providence City.....	1,361.....	1,365.....	107.6, or.....	51.82 and 48.18 in each 100.
Rest of the State.....	1,880.....	1,790.....	105.1, or.....	51.24 and 48.76 in each 100

## TWENTY-FIVE YEARS, 1854 TO 1878, INCLUSIVE.

	Males to each			
	Males.	Females.	100 Females.	Males. Females.
Providence City.....	24,051.....	22,774.....	106.6, or.....	51.36 and 48.64 in each 100.
Rest of the State.....	38,297.....	35,723.....	107.2, or.....	51.74 and 48.26 in each 100.

A period of a quarter of a century affords a very fair number of years for summing up the results of single years, for the purpose of ascertaining the general averages, and arriving at approximate conclusions to say the least.

From the averages of twenty-five years, 1854 to 1878 inclusive, as shown in the summary above, it would seem that the influences of city life as existing in the city of Providence, and the influences of village and country life as existing elsewhere in the State, in the causation of sex, were not very dissimilar, or that the differences of sex in the children born in Rhode Island, were but slightly influenced by them.

The following Table, continued from the last report, shows the relative proportions of the sexes, in each of the last eighteen years, in each of the larger divisions of the State, and in the whole State:

TABLE XX.

NUMBER OF MALES TO EACH 100 FEMALES.

BIRTHS.	Bristol County.	Kent County.	Newport County.	Providence County, Towns.	Providence City.	Washington County.	Whole State.
1863.....	120.0	96.4	97.0	101.8	111.4	108.7	105.8
1864.....	106.8	87.3	90.6	107.4	97.3	108.4	100.3
1865.....	119.3	118.2	108.8	118.9	118.8	88.1	112.9
1866.....	109.4	118.1	108.4	104.9	108.4	124.0	108.0
1867.....	115.5	98.3	117.8	106.3	104.5	120.4	107.7
1868.....	117.4	88.7	100.2	101.6	102.4	136.5	104.5
1869.....	115.7	116.7	102.7	98.0	107.5	120.6	104.9
1870.....	126.4	111.6	100.0	105.1	104.9	99.5	105.6
1871.....	131.8	97.9	122.5	100.8	95.2	113.8	102.8
1872.....	109.2	93.8	109.1	108.5	95.7	110.6	100.9
1873.....	129.2	113.0	117.9	104.5	109.0	104.7	108.6
1874.....	98.7	111.9	101.8	110.4	102.9	94.0	104.9
1875.....	95.2	108.1	97.7	104.8	109.1	134.3	105.9
1876.....	142.1	104.4	108.5	108.0	106.8	108.7	108.3
1877.....	138.7	102.4	98.5	100.3	104.9	95.3	103.0
1878.....	120.5	120.6	94.8	101.5	106.8	78.8	102.7
1879.....	124.3	95.5	108.6	105.4	105.7	106.3	105.4
1880.....	117.2	110.5	113.0	102.4	107.6	95.4	106.1

The difference in the number of each sex comparatively, as they vary from year to year in the different divisions of the State, is a matter of some curiosity. Thus, we find by an examination of Table XX, that in Bristol County, in 1876, the proportions were 142.1 males to each 100 females, while in the preceding year there were but 95.2 to each 100 females. In Washington county, in 1868, the proportions were 136.5 males to each 100 females; while in 1878, in the same county, they stood 78.8 males to each 100 females. Nothing is known as to the causes of these differences, and they are simply regarded as fortuitous events. And why there should be in every year, in every population of more than fifty thousand persons, a preponderance of births of male children, is a question still unsettled.

From observations made by physicians for all the periods of medical writings, it does not appear that the greater physical vigor of either parent, has much influence in the causation of sex.

During 1880, Bristol County reported the largest proportion of

males to females, and the same may be said of that county during the last five years, showing a proportionate average for that period of 128.5 males to each 100 females.

The town of Bristol has not only shown a large proportion of males to females, but has also the highest birth rate of any town in the State.

#### BIRTHS: SEX AND SEASON.

The number of births as they occurred during the several months in the year 1880, and the different divisions of the State in which they occurred, may be found in Table II, page 4. From it the number of children born during each month and quarter of the year may be ascertained, and the relative proportions of the sexes, during each of these periods, and also the aggregates and proportions of the same for the whole State.

The following Table will present a summary of the quarterly periods, number of births and proportions of the sexes for those periods, in the whole State:

	Males to each			
	Males.	Females.	100 Females.	Males. Females.
1. January—March.....	796	725	109.7, or.....	52.3 and 47.7 in each 100.
2. April—June.....	735	748	98.2, or....	49.5 and 50.5 in each 100.
3. July—September.....	834	806	103.4, or .....	50.7 and 49.3 in each 100.
4. October—December....	876	775	113.0, or.....	53.0 and 47.0 in each 100.
Whole Year, 1880.....	3,241	3,054	106.1	51.5 and 48.5 in each 100.

The following Table, continued from the last report, shows the number of male children born to each 100 female children, in each quarter of each of the last fifteen years:

TABLE XXI.

YEARS.	1880.	1879.	1878.	1877.	1876.	1875.	1874.	1873.	1872.	1871.	1870.	1869.	1868.	1867.	1866.
1st Quarter.....	109.7	104.6	106.6	107.9	105.7	97.7	100.4	98.3	98.8	112.4	111.6	107.3	102.4	105.5	108.7
2d Quarter.....	98.2	104.3	98.9	103.1	109.2	113.8	108.2	105.9	100.5	95.0	100.8	105.1	118.6	108.9	102.9
3d Quarter....	103.4	101.6	103.8	97.6	108.0	108.2	105.1	109.9	101.6	99.3	101.0	101.9	103.1	110.4	113.8
4th Quarter.....	113.0	111.4	102.0	104.2	110.4	107.9	105.9	110.4	103.4	105.0	109.2	105.6	96.2	106.5	105.6
Whole Year.....	106.1	105.4	102.7	103.0	108.3	108.9	104.9	108.6	100.9	102.8	105.6	104.9	104.5	107.7	108.0

The proportions of the sexes of children born during 1880 in Rhode Island, in the different quarterly periods, have varied more than the average of fifteen years. There was a difference of about six per cent. more of males than of the opposite sex, between the first and third quarters; and a difference of seven and one-half per cent. in favor of the male sex, between the second and fourth quarters.

The proportion of the whole year, 106.1 males to each 100 females, is larger than the average of fifteen years, which is 105.0 males to each 100 females.

The possible influence of season in the causation of the sex of the children born in Rhode Island, may be more fully illustrated by the following summary prepared for that purpose, and which shows the number and sex of the children born in the State in each quarter of the year, and also the proportions of the sexes in each quarter, in the aggregate of a period of twenty years next preceding 1880:

Males to each					
	Males.	Females.	100 Females.	Males.	Females.
1. January—March.....	12,912.....	12,302.....	105.8, or.....	51.41 and	48.59 in each 100 births.
2. April—June... ..	13,006. . . . .	12,326. . . . .	106.4, or.....	51.55 and	48.45 in each 100 births.
3. July—September.....	14,188.....	13,611.....	104.3, or.....	50.85 and	49.15 in each 100 births.
4. October—December... ..	14,971.....	14,072.....	106.4, or.....	51.55 and	48.45 in each 100 births.
<hr/>					
Whole No. 20 years.....	55,077.....	52,151.. . . .	105.6, or.....	51.37 and	48.63 in each 100 births.

It will be seen that the greatest average difference between the numbers of the sexes born in the different quarters, is between the third quarter; and the second and fourth, which are alike. This difference of 104.3 males to each 100 females, in the third quarter, or about 2.2 per cent. males in excess of females in each 100 children born of both sexes, compared with the largest average of any quarter, that is 106.4 males to each 100 females, or about 3.2 per cent. males in excess of females, and which is less than one per cent., is not strongly confirmatory of a belief that season has any decided influence in the causation of sex.

#### BIRTHS AND SEASON.

The influence of season in regard to human productiveness, including the whole number of children of both sexes born, may also claim attention as a question of considerable importance.

The following Table shows the total number of children born in the State of Rhode Island, (according to the returns,) in each quarter of each of the last ten years; and also the aggregate number and the percentage of the aggregate in each quarter for twenty-seven years, from 1853 to 1879, inclusive:

TABLE XXII.

QUARTERS.	1880.	1879.	1878.	1877.	1876.	1875.	1874.	1873.	1872.	1871.	1853 to 1879.	
											Number.	Per cent.
January—March...	1,521	1,465	1,622	1,399	1,594	1,546	1,485	1,382	1,348	1,332	30,402	23.71
April—June.....	1,483	1,556	1,565	1,406	1,496	1,608	1,555	1,399	1,464	1,390	30,115	23.50
July—September...	1,640	1,653	1,731	1,674	1,668	1,668	1,692	1,593	1,663	1,475	33,569	26.21
October—December	1,651	1,676	1,796	1,756	1,641	1,686	1,744	1,658	1,668	1,572	34,079	26.58
Whole year.....	6,296	6,350	6,714	6,235	6,329	6,508	6,466	6,022	6,143	5,678	128,195	100.00

During a period of twenty-seven years, as will be seen by the above Table, the average order of the occurrence of births in the different quarters of the year, from the smallest number upward, has been as follows, viz. second, first, third, fourth. The returns for 1880 show the same result.

The year 1880 also follows the rule of the long period in returning a considerably smaller number during the first than during the last half of the year, although the difference is not as great during 1880, in which year the proportions stand 47.7 of the whole number during the first half, and 52.3 during the last half, as against the average of 47.2 during the first, and 52.8 during the last half of the years composing the long period.

It has been mentioned in previous reports, that in the city of Providence when the facts of birth are collected semi-annually, the difference in the number between the first and last halves of the year is much less, and suggests the probability of incomplete collection of the occurrences of birth in localities where the collection is deferred to the commencement of the following year.

The percentages of the different quarters of the year 1880, were as follows: First quarter, 24.16; Second quarter, 23.55; Third quarter, 26.08; Fourth quarter, 26.21.

#### PARENTAGE.

By reference to Table I., page 2, in the division of births, there will be found the parentage of the children born in Rhode Island during the year 1880. It will be seen that of the whole number—6,295—there were 2,741 of American parentage, 2,555 foreign, and 999 of mixed parentage.

The following Table will show the parentage of the children born in the State, and the variations of the same from year to year, in each

of the last five years, and also the number and variations occurring in four periods of five years each, from 1858 to 1877 inclusive.

TABLE XXIII.

PARENTAGE.	1880.	1879.	1878.	1877.	1876.	5 years. 1873 to 1877.	5 years. 1868 to 1872.	5 years. 1863 to 1867.	5 years. 1858 to 1862.
American.....	2,741	2,767	2,867	2,665	2,565	13,431	12,214	9,712	10,009
Foreign.....	2,555	2,573	2,848	2,642	2,873	13,990	12,366	9,068	9,697
Amer. father and For. mother.	417	442	463	416	354	11,782	1,353	876	814
For. father and Amer. mother.	589	568	516	512	517	2,357	1,730	941	755
Parentage not stated.....								70	222
Total.....	6,295	6,350	6,714	6,225	6,329	31,560	27,663	21,567	22,008

The changes that have occurred in the proportions of the births in the different classes, during the period of twenty-three years, may be shown in a different, and perhaps clearer manner, by the following Table of *percentages* :

TABLE XXIV.

PARENTAGE.	1880.	1879.	1878.	1877.	1876.	5 years. 1873 to 1877.	5 years. 1868 to 1872.	5 years. 1863 to 1867.	5 years. 1858 to 1862.
American.....	43.55	43.57	43.00	42.74	40.84	42.55	44.17	45.18	43.50
Foreign.....	40.60	40.53	43.82	42.38	45.40	44.35	44.72	46.37	44.33
Amer. father and For. mother.	6.62	6.96	6.85	6.67	5.59	5.84	4.89	4.07	3.72
For. father and Amer. mother.	9.23	8.94	7.88	8.21	8.17	7.26	6.22	4.38	3.45
Total.....	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

The above Table is interesting as showing the changes that have occurred in Rhode Island, in regard to the proportions respectively of the children born of native and foreign born citizens, and of children born of parents of which one was native and the other foreign born.

It will be observed that during the period of five years, from 1858 to 1862 inclusive, the proportion of births of purely American parents was nearly one half of the whole number. It will also be observed that the proportion of births of children of the same parentage gradually lessened until in 1876, fourteen years thereafter, it was only 40.84 per cent. It then in the following year began to increase, and

has so continued to the present time, the difference between the year 1879 and 1880, however, being exceedingly slight, a simple falling off of less than three hundredths of one per cent.

It will be seen also that the maximum proportion of births of children of purely foreign parentage occurred between 1863 and 1867, since which time, with slight exceptions, the proportion has gradually declined.

In 1863 the proportion of children born of foreign parentage was 46.79, the largest during the existence of the State.

In 1880 the proportion of the same was 40.60.

In the meantime the proportion of children born of American fathers and foreign mothers has increased from 3.72 per cent. in 1863, and in the average of five previous years, to 6.62 per cent. in 1880.

At the same time, and during the same period, the children born of foreign fathers and American mothers have increased from the proportion of 3.45 per cent. to 9.23 per cent.

Previous to 1863 the number of children born of mixed parentage was scarcely more than seven per cent. in any year. In 1879 the proportion of the same was 15.90 per cent., and in 1880 15.85 per cent.

It has been the custom, for several years past, to contrast the number and percentages of the children born in the different classes with the percentages according to population. But at the time of making up this Report the number of persons of foreign parentage in Rhode Island (not exclusively foreign born) had not been forwarded from the Census Bureau, at Washington.

#### COLORED CHILDREN.

The number of births of children of colored parentage reported for the year 1880 is 140. They are always included in the general statistics of births, but having some special importance as to the survival of the race, and other questions, they have had a separate consideration. The number is smaller by 19 than that of 1879, and smaller by 32 than that of 1878.

In regard to sex the numbers and proportions were as follows, viz.: Males, 75; females, 65; or 53.57 males and 46.43 females in every 100 births; or 115.4 males to each 100 females.

The towns reporting colored births in 1880, and the number in each, are as follows:

Bristol.....	4	Cranston ..	1	Smithfield.....	1
Coventry.....	1	East Providence.....	3	NorthKingstown.....	2
East Greenwich.....	4	Foster.....	1	South Kingstown.....	4
Warwick.....	6	Johnston.....	2	Richmond.....	3
Middletown.....	1	Lincoln.....	1	Providence City.....	.87
Newport City.....	19				
Total.....		140.			

The towns from which no returns of births of colored children were made for the year 1880 are as follows, viz.: Barrington, Warren, West Greenwich, Jamestown, Little Compton, New Shoreham, Portsmouth, Tiverton, Burrillville, Cumberland, Gloucester, North Providence, North Smithfield, Pawtucket, Scituate, Woonsocket, Charlestown, Exeter, Hopkinton and Westerly.

The question of perpetuity of the colored race will be considered on another page, where mortality and the color of decedents is taken up.

#### NUMBER OF THE CHILD OF THE MOTHER IN THE ORDER OF BIRTH.

Something may be learned of the physical capacity of any people by a record of the number and percentage of the births among them, and the number of the child of each mother. Such records, however, can only afford general conclusions, as there are so many circumstances that may prevail to modify the number of births as a whole, and also the number born of each mother.

The following Table shows the number of the child of the mother; that is, how many of the children born were reported as the first, second, third, &c., of their respective mothers. The statistics on this subject begin with the year 1857, and the following Table includes the children reported in 1879, and in 1880, and also the total for twenty-four years, 1857 to 1880 inclusive:



TABLE XXV.

NUMBER OF THE CHILD OF THE MOTHER.	1879.	1880.	24 years. 1857-1880.
First.....	1,435	1,480	30,183
Second.....	1,194	1,123	24,804
Third.....	1,008	1,014	19,447
Fourth.....	809	770	14,607
Fifth.....	593	581	10,859
Sixth.....	437	439	7,866
Seventh.....	309	307	5,503
Eighth.....	221	211	3,748
Ninth.....	138	140	2,478
Tenth.....	77	93	1,612
Eleventh.....	53	74	933
Twelfth.....	37	26	561
Thirteenth.....	29	14	285
Fourteenth.....	10	13	145
Fifteenth.....	5	5	80
Sixteenth.....	4	5	42
Seventeenth.....	1	0	26
Eighteenth.....	0	0	7
Nineteenth.....	0	0	5
Twentieth.....	0	0	3
Twenty-first.....	0	0	3
Twenty-second.....	0	0	2
Total.....	6,350	6,295	123,199

It will be observed that there was a larger number of births in 1880 of the first child of the mother than in 1879, and the same was also true of the two years preceding 1879.

The proportionate number of the first children reported in 1880 was 23.50 in each 100 births. This proportion is smaller than the average of a quarter of a century of registration, which is about 24.50 in each 100 births.

There are in every year more or less births reported, in which the number of child of the mother is not given, and therefore the proportion of each cannot be given with entire exactness, neither does the number of births given in the above Table show the entire number of children born, because of the same reason.

The following Table shows what percentage of the children born in

each of the last six years were the first, second, &c., children of the mothers, and also the average percentage of the same for a period of ten years, from 1868 to 1877 inclusive:

TABLE XXVI.

NUMBER OF THE CHILD.	1880.	1879.	1878.	1877.	1876.	1875.	10 years. From 1868 to 1877.
First.....	25.50	22.59	21.77	22.93	24.11	24.37	25.31
Second.....	17.84	18.80	20.26	20.93	20.63	20.80	20.65
Third.....	16.11	15.87	18.90	16.22	16.04	14.93	15.49
Fourth.....	12.94	12.74	12.32	12.09	12.00	11.78	11.37
Fifth.....	9.23	9.33	8.77	9.07	8.42	8.81	8.38
First to Fifth ..	78.93	79.33	82.03	81.29	81.30	80.69	81.10
Sixth and over.....	21.08	20.67	17.98	18.71	18.80	19.31	18.90
Total.....	100.00	100.00	100.00	100.00	100.00	100.00	100.00

It will be seen by the above Table that the proportion of the second children of the mother, born in 1880, was not only smaller than in any one of the previous five years, but considerably smaller than the average of a period of thirteen years.

More or less variation is to be expected from year to year, but the difference between 17.84 per cent. in 1880 and the average of a considerable number of years (nearly three per cent), is, to say the least, quite unusual.

## PLURALITY BIRTHS.

The statistics of plurality births in Rhode Island for 1880 may be found on page 6, Table III. It will be seen that there were fifty-three cases during the year; all of twins. The number of children was 106, of which 55 were males, and 51 were females.

Of the 53 cases, 25 were in Providence city; 15 in Providence county towns; 8 in Newport county; 4 in Bristol county, and one in Washington county.

The parentage of the same was as follows: of the cases 20 were of purely American; 20, Irish; 4, English; 2, Portuguese; one German, and 6 of mixed parentage, of which 2 were of American fathers, 3 of English fathers, and one of Irish father.

In regard to season, the numbers in the different months were as follows:

January.....	5	April.....	3	July.....	5	October.....	2
February.....	4	May.....	6	August.....	5	November.....	3
March.....	5	June.....	5	September.....	5	December.....	5
First quarter.....	14	Second quarter.....	14	Third quarter.....	15	Fourth quarter.....	19
Total.....						53.	

The general statistics of births reported in Rhode Island during a period of twenty-eight years, that is, from 1853 to 1880 inclusive, are as follows:

133,102 cases of single births.....	giving 133,102 children.
1,416 cases of twin births.....	giving 2,832 children.
18 cases of triple births.....	giving 54 children.
134,536 cases of child-birth.....	giving 135,988 children.

Of the whole number of cases of child-birth (134,536) during the twenty-eight years, one in 95.0 produced twins, and one in 7,474 produced triplets.

Of the whole number of children born during the same period (135,988), ascertained from the reports, one in every 48 was a twin, and one in every 2,519 was a triplet.

Of the 1,416 cases of plurality births which have occurred in the State during the last twenty-eight years, there were 611 cases in which both parents were Americans; 674 cases in which both parents were foreign; 121 cases in which the parentage was mixed; that is, one American and one foreign parent; and 8 in which the parentage was not stated.

The whole number of children born in plurality cases during the twenty-eight years was 2,886, of whom 1,453 were males, and 1,429 were females; the sex of the remaining four was not given.

#### STILL-BORN CHILDREN.

The statistics in relation to still-born children, as stated in previous reports, are obtained from the returns of deaths, but are not numbered with, or in any way included in the statistics of deaths of this or previous reports.

For the reason that they occupy a somewhat anomalous position in the statistics of life and death, they are given a separate consideration.

The whole number of still-born children reported in Rhode Island for the year 1880 was 192; this is 24 less than for the year 1879, and 56 less than for 1878.

The following are the numbers reported from the different divisions of the State :

Bristol County.....	12	Providence County, Towns.....	37
Kent County.....	3	Providence City.....	121
Newport County, Towns.....	4	Washington County.....	4
Newport City.....	12	Whole State.....	192

There were fourteen towns from which no report of still-born children was received, 4 more than in 1879, and 5 more than in 1878.

*Sex.*—Of the 192 still-born children, 123 were males and 69 females.

*Parentage.*—Of the 192 births of this class, the parentage was divided as follows :

American parents.....	104
Foreign parents.....	88
Whole number.....	192

*Color.*—The divisions of the still-born children in respect to color were as follows :

White.....	180	Black.....	12
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The number of colored still-born children was the same as in 1879 and in 1878.

Of the white still-born children there were 24 less than in 1879, and 44 less than in 1878.

*Season.*—The number of still-born children reported in each of the several months of 1880 was as follows :

January.....	20	May.....	12	September.....	12
February.....	18	June.....	18	October.....	14
March.....	15	July.....	16	November.....	21
April.....	17	August.....	9	December.....	20
Total...	192				

#### SUMMARY OF STILL-BORN.

The following Table shows the number and sex of the still-born children whose births were reported in Rhode Island during the period from June 1, 1852, to December 31, 1880, and for each of the last five years :

TABLE XXVII.

SEX.	1880.	1879.	1878.	1877.	1876.	June 1, 1852, to Dec. 31, 1880.	Total.
Males.....	123	124	149	147	181	2,967	3,090
Females.....	69	92	99	95	92	1,982	2,051
Sex not stated.....						52	52
Total.....	192	216	248	242	273	5,001	5,193

It will be seen that the whole number of still-births reported in the State since June 1, 1852, is 5,193. Of the sex of this number, there were 3,090 males, 2,051 females, and of 52 the sex was not given. The ratio of occurrence, in regard to sex, would therefore be as follows: In each 100 children there were 60 males, and 40 females; or for every 100 females there were 150 males.

It will be seen that the proportion for the year 1880 varies somewhat from the average of a period of more than twenty-eight years. The proportion standing 178 males to each 100 females; or 64 males and 36 females in each 100. It is difficult to account for the great disproportion of the sexes of the still-born children.

*Season of Still-births.*—The following summary will show the number of still-births that have been reported in Rhode Island during a period of twenty-eight years, from 1853 to 1880 inclusive, with the months and quarters in which they occurred:

STILL-BORN—TWENTY-EIGHT YEARS—1853-1880. SEASON.			
January... .. 469	April .. . . . . 394	July..... . . . . 447	October..... . . . . 398
February..... . . . . 483	May..... . . . . 408	August..... . . . . 459	November..... . . . . 438
March..... . . . . 412	June..... . . . . 386	September..... . . . . 433	December..... . . . . 491
1st Quarter.....1,314	2d Quarter.....1,183	3d Quarter.....1,339	4th Quarter.....1,327

First six months, 2,496; second six months, 2,666; total, 5162.

It will be seen that with respect to season, the number of still-births in the aggregate of the different months and quarters in which they occurred during a period of twenty-eight years, did not vary greatly in the first, third and fourth quarters, the second quarter having about 10 per cent. less than the others. Of the different months December had about 12 per cent. more still-births than the general average.

#### PARENTAGE OF STILL-BORN.

Some interest has been heretofore manifested in regard to the parentage of the still-born. It is a question having some physiological importance, involving the changes that have occurred in the proportional number of the still-born of American and foreign origin, respectively, from year to year. Previous to 1859 the parentage of the still-born was not reported.

During the thirteen years from 1859 to 1871 inclusive, the whole number of still-births reported was 2,263, of which the parentage was as follows: American, 927; foreign, 1,334; unknown, 2.

The proportions were, therefore, 41.0 American and 59.0 foreign in each 100.

To show the changes that have occurred from year to year in the percentages of parentage of the still-born, in contrast with the percentages of the same nativities to the whole number of births, the following resumé is presented :

Years.	Of Whole No. Births.		Of Whole No. Still-born.	
	American.	Foreign.	American.	Foreign.
1871.....	49.36	and 50.64 in each 100.	41.00	and 59.00 in each 100.
1872.....	47.59	and 52.41 in each 100.	41.25	and 58.75 in each 100.
1873.....	50.30	and 49.70 in each 100.	59.31	and 40.79 in each 100.
1874.....	47.14	and 52.86 in each 100.	50.00	and 50.00 in each 100.
1875.....	47.88	and 52.12 in each 100.	49.19	and 50.81 in each 100.
1876.....	46.48	and 53.52 in each 100.	45.76	and 54.24 in each 100.
1877.....	49.41	and 51.59 in each 100.	53.31	and 46.69 in each 100.
1878.....	49.35	and 50.65 in each 100.	55.65	and 44.35 in each 100.
1879.....	50.53	and 49.47 in each 100.	54.63	and 45.37 in each 100.
1880.....	50.17	and 49.83 in each 100.	54.16	and 45.84 in each 100.
15 years.				
1858-1873.....	50.54	and 49.46 in each 100.	41.25	and 58.75 in each 100.
7 years.				
1873-1879.....	48.57	and 51.43 in each 100.	52.55	and 47.45 in each 100.

## MARRIAGES, 1880.

The number of marriages reported in Rhode Island during the year 1880 was 2,769. This number was 373 more than in 1879, and 445 more than in 1878.

The general statistics of marriages in 1880, in relation to season and number in the different divisions of the State, may be found in Table IV., on the seventh page.

### SEASON.

The number and percentage of marriages in Rhode Island, in each quarter of the year 1880, may be found in the following Table, together with the aggregate number and percentage in each quarter for the twenty-seven years previous, viz., from 1853 to 1879 inclusive :

TABLE XXVIII.

YEARS.		First Quarter.	Second Quarter.	Third Quarter.	Fourth Quarter.	Whole Year.
1880.....	Number.....	574	705	630	860	2,769
	Percentage.....	20.73	25.46	22.75	31.06	100.00
27 Years. 1853-1879.....	Number.....	11,863	13,111	14,546	15,714	55,234
	Percentage.....	22.36	24.62	26.57	26.45	100.00

It has happened with scarcely an exception during the whole period of registration in Rhode Island, that the largest number of marriages in any quarter of the year have been in the last quarter, and the smallest number in the first quarter.

It will be seen that the difference in percentage between the first and last quarters of 1880 is larger than the average of twenty-seven years, and that the percentages of first and third quarters of 1880 are smaller, and the second and fourth are larger than the average of the long period.

### NATIVITY OF PERSONS MARRIED.

The following Table shows the number of marriages, according to the nativity of the parties, for each of the last eight years, and also for the aggregate of twenty years, from 1858 to 1877 inclusive :

TABLE XXIX.

BIRTH-PLACE.	1880.	1879.	1878.	1877.	1876.	1875.	1874.	1873.	20 years. 1858-77. Total.
United States.....	1,775	1,511	1,455	1,407	1,408	1,467	1,495	1,620	25,674
Foreign Countries.....	548	467	493	496	513	614	695	702	10,963
American groom, foreign bride.....	202	209	181	177	144	191	154	138	2,410
Foreign groom, American bride.....	244	209	195	202	194	213	197	170	2,750
Not stated.....									64
Total.....	2,769	2,396	2,324	2,282	2,353	2,485	2,541	2,630	41,861

There was not only a larger number of marriages in 1880 in all classes taken together, but also a considerable increase in each of the several classes, except that of American groom and foreign bride.

In the class of foreign born the number is larger than in any year since 1875.

During the last two or three years there has been a considerable accession to the population of the State, of immigrants of usual marriageable age, from Germany, Sweden and Canada. These, in addition to the ordinary number from other foreign countries, have increased the number of marriageable persons of that class, and as the inclination to assume the marriage relation is more readily indulged by persons of foreign birth than of native birth, the number of marriages of that class has correspondingly increased.

For several years previous to 1880 the number of marriages in the class of foreign birth had gradually grown smaller, by reason of lessened immigration and the ordinary casualties of life.

The increase in number in 1880 will hardly be held for any lengthy period, and the increased proportion which, as will be seen in Table XXX. is only three tenths of one per cent., will doubtless decrease from year to year, as it has done for many years past with scarcely an exception.

It will be understood that in considering the proportion of marriages in the class of foreign born, the marriages of persons born in the United States of foreign parentage are not included.

It will therefore be perceived that the proportion of marriages of persons native born, including those born of foreign parentage and of American parentage, must inevitably increase.

The number of marriages in the class of mixed parentage, that is, where one of the parties was native born and the other foreign born,



is also larger than in any previous year, although the proportion to the whole number, as may be seen in Table XXX., is less than in any year since 1876.

The class of mixed marriages in which the groom was foreign born and the bride American, has as usual a larger proportion than that where the groom was American and bride foreign born.

In the following Table are given the percentages of American, foreign and mixed marriages in each of the last six years, and in the aggregate for the twenty years, 1858 to 1877 inclusive. By *mixed* marriages are meant those where one party was of American and the other of foreign birth :

TABLE XXX.

BIRTH-PLACE.	1880.	1879.	1878.	1877.	1876.	1875.	20 years. Total.
United States.....	64.10	63.06	63.60	61.66	62.23	59.04	61.33
Foreign Countries.....	19.79	19.49	21.22	21.73	22.77	24.70	20.19
Mixed.....	16.11	17.45	15.18	16.61	15.00	16.26	18.48
Total.....	100.00	100.00	100.00	100.00	100.00	100.00	100.00

The proportion of marriages of persons native born in 1880 was larger than in any one of the last fifteen years, and also larger than the average annual proportion of a period of twenty-three years.

And this proportion, as previously remarked, must continue to increase as all those born in the United States, whether of American or foreign parentage, are classed as Americans in the marriage statistics.

#### AGES OF PERSONS MARRIED.

The number of persons married in Rhode Island during the year 1880, in the different periods of life, is shown in Table V. on page 8. The number of each sex, in each division of age, can also be found in the following Table :

TABLE XXXI.

1880.	Under 20.	20 to 25.	25 to 30.	30 to 35.	35 to 40.	40 to 45.	45 to 50.	50 to 55.	55 to 60.	60 to 65.	65 to 70.	70 to 75.	75 to 80.	80 to 85.	85 to 90.	Not stated.
Males. . . . .	102	1,077	764	345	306	97	64	53	24	18	13	3	3	1	.....	
Females.....	586	1,324	496	211	123	66	27	13	9	9	2	...	.....	.....	.....	1
Total....	688	2,401	1,260	556	329	163	91	66	33	27	15	3	3	1	...	1

The marriage statistics of every year show more or less couples assuming the marital relation, with very considerable disparities of age between the contracting parties.

Table V., on the eighth page, presents some of these curious alliances.

It will there be seen that ten men between 35 and 40, and four men between 40 and 45, took young brides under 20 years of age; three grooms from 60 to 65 took brides from 20 to 25; and one from 75 to 80 took a bride between 30 and 35 years of age.

Public sentiment, however, accepts and in some measure approves a considerably more advanced age in the groom as compared with the bride, and hence the larger number of marriages in which the groom is the senior of the bride by more or less years. When, therefore, there is a considerable disparity in the ages of the parties to a marriage contract, and that disparity is in the more advanced age of the bride, it is a matter of greater public comment and wonder, and of less frequent occurrence.

During the year 1880 three women between 35 and 40 took husbands between 20 and 25; one bride between 55 and 60 took a husband between 35 and 40; and one bride between 60 and 65 took a groom between 40 and 45 years of age.

The following table shows the number of persons married in Rhode Island, including both sexes, in each division of ages, in each of the last fifteen years, from 1866 to 1880 inclusive :

TABLE XXXII.

YEARS.	Under 20.	20 to 25.	25 to 30.	30 to 35.	35 to 40.	40 to 45.	45 to 50.	50 to 55.	55 to 60.	60 to 65.	65 to 70.	70 to 75.	75 to 80.	80 to 85.	85 to 90.	Not stated.
1866.....	693	1,981	1,085	419	218	127	81	59	25	21	12	7	.....	.....	.....	23
1867.....	696	1,896	1,104	416	211	148	91	48	37	18	18	5	3	1	.....	6
1868.....	644	1,835	1,050	432	219	133	82	61	30	29	11	8	4	.....	.....	32
1869.....	642	1,814	1,051	468	237	134	79	46	35	15	11	2	3	2	.....	49
1870.....	744	1,883	1,064	415	216	159	86	64	26	24	12	3	2	.....	.....	6
1871.....	697	1,914	1,118	392	228	115	73	56	35	32	6	7	3	.....	.....	6
1872.....	786	2,073	1,182	434	237	131	81	61	43	21	13	6	1	.....	.....	5
1873.....	762	2,177	1,156	507	253	140	87	68	35	24	12	6	6	.....	.....	27
1874.....	770	1,992	1,179	459	268	159	101	52	36	39	8	9	1	.....	.....	9
1875.....	681	2,058	1,108	475	252	150	101	60	32	29	13	4	1	.....	.....	6
1876.....	691	1,741	1,041	450	224	154	80	53	27	19	12	3	2	.....	.....	9
1877.....	681	1,745	1,118	459	244	125	92	52	46	14	15	11	2	1	.....	9
1878.....	618	1,832	1,123	441	259	162	74	49	39	20	17	2	4	.....	.....	8
1879.....	639	1,879	1,156	481	272	123	78	56	39	26	18	9	2	2	1 11	
1880.....	698	2,301	1,262	556	329	163	91	65	33	27	15	3	3	1	.....	1

The proportion to the whole number of persons married in 1880, of those under 20 years of age was 12.42 per cent. In 1879 the proportion was 13.33 per cent.; in 1878, 13.30 per cent.: in 1872, 15.49 per cent. There has been a gradual diminution from year to year, with only exceptions enough to prove the rule, of the proportion of persons entering the marriage state under 20 years of age.

In all the periods of life between 20 and 45 the number of marriages in 1880 was larger than ever before recorded. The relative proportions of the sexes in the different ages will be given below.

#### PROPORTION OF SEX.

The following Tables will show the percentages of males and females married, in each division of ages, in each of the last twenty-one years:

TABLE XXXIII.

YEARS.							Total.
	Under 20.	20 to 25.	25 to 30.	30 to 40.	40 to 50.	50 & over.	
1860.....	5.0	42.8	26.9	16.3	5.7	3.3	100.00
1861.....	4.6	44.5	25.4	15.5	5.8	4.2	100.00
1862.....	4.2	37.8	27.9	18.3	5.9	5.9	100.00
1863.....	3.5	38.0	29.6	17.2	5.8	5.9	100.00
1864.....	4.3	38.8	27.3	17.9	7.4	4.3	100.00
1865.....	3.5	37.0	28.4	18.9	7.5	4.7	100.00
1866.....	5.3	40.9	27.0	16.4	6.3	4.1	100.00
1867.....	4.3	40.1	27.9	16.8	6.8	4.1	100.00
1868.....	4.1	39.9	28.2	17.1	6.1	4.6	100.00
1869.....	4.3	39.6	27.7	18.5	6.1	3.8	100.00
1870.....	4.8	40.4	28.1	16.0	6.4	4.3	100.00
1871.....	5.3	40.1	28.9	16.5	4.9	4.3	100.00
1872.....	4.3	41.3	28.2	16.6	5.2	4.4	100.00
1873.....	3.9	42.4	26.7	17.0	6.0	4.1	100.00
1874.....	4.1	40.4	27.2	17.5	6.4	4.4	100.00
1875.....	3.5	40.9	27.8	17.5	6.1	4.2	100.00
1876.....	5.1	37.5	28.6	17.9	5.6	4.3	100.00
1877.....	4.3	36.0	30.2	18.7	5.9	4.9	100.00
1878.....	3.9	38.5	29.0	18.0	6.3	4.3	100.00
1879.....	3.9	37.8	28.8	19.3	5.4	4.8	100.00
1880.....	3.6	38.9	27.5	19.9	5.8	4.3	100.00

MALES.

TABLE XXXIV.

	YEARS.							Total.
		Under 20.	20 to 25.	25 to 30.	30 to 40.	40 to 50.	50 & over.	
FEMALES.	1860.....	35.8	44.1	17.0	9.1	2.6	1.4	100.00
	1861.....	39.6	42.0	15.2	7.8	4.1	1.3	100.00
	1862.....	24.9	41.3	16.7	11.8	4.1	1.2	100.00
	1863.....	34.9	42.6	16.9	9.8	4.1	1.7	100.00
	1864.....	34.2	43.4	17.8	10.3	2.9	1.4	100.00
	1865.....	22.6	42.3	19.1	11.0	3.5	1.5	100.00
	1866.....	24.7	42.9	17.4	11.0	2.7	1.3	100.00
	1867.....	25.4	40.5	19.3	10.0	3.4	1.4	100.00
	1868.....	34.4	40.9	18.1	11.6	3.3	1.7	100.00
	1869.....	24.1	40.5	18.7	12.1	3.4	1.3	100.00
	1870.....	36.8	39.4	17.9	10.8	3.9	1.2	100.00
	1871.....	34.6	41.9	19.1	10.1	3.1	1.2	100.00
	1872.....	26.7	40.5	18.4	9.9	3.2	1.3	100.00
	1873.....	25.3	40.8	17.5	12.0	2.7	1.7	100.00
	1874.....	26.3	38.1	19.3	11.1	3.9	1.3	100.00
	1875.....	23.9	42.1	16.8	11.8	4.0	1.4	100.00
	1876.....	26.6	39.8	17.6	12.0	3.7	1.3	100.00
	1877.....	23.4	40.4	18.8	12.1	3.6	1.7	100.00
	1878.....	22.7	40.4	19.3	12.2	3.8	1.6	100.00
	1879.....	22.8	40.7	19.4	12.1	3.0	2.0	100.00
	1880.....	21.1	44.2	18.0	12.0	3.3	1.4	100.00

It will be seen by the preceding Tables that the percentage of marriage of persons under 20 years of age, of both sexes, is considerably less than the average of the last twenty-one years, that the proportion of females under 20 is less than in any one of the twenty-one years, and with the exception of 1875, the same may be said of males under 20 entering the marriage state.

The annual average of marriages of the male sex under 20 for twenty years, 1860 to 1880, was 4.3 per cent.

The annual average of marriages of females under 20, during the same period was 25.83 per cent.

Of persons of 50 years of age and over, who enter the marriage state, the proportion to the whole number married is very small. Of males the average annual proportion during a period of twenty years was less than four and one half persons in each one hundred, and of females the average proportion for the same period was less than one and one half persons in each one hundred married.

## COLORED MARRIAGES.

The number of marriages of persons of color in Rhode Island during the year 1880 was 76. This number is 15 more than in 1879, and 4 less than in 1878. The increase has been largely in the city of Providence.

The following summary will show what the proportion of colored persons married during each of the five years from 1876 to 1880 inclusive, bears to the whole number of colored persons in the State; and also a comparison of these several proportions with the proportions which the whole number of persons married in each of the same years, bears to the whole population of the State.

	1880.	1879.	1878.	1877.	1876.
Ratio of colored persons married to whole of colored population of the State.	One in every	One in every	One in every	One in every	One in every
.....	43.3	51.4	39.1	49.0	53.1
Ratio of whole number of persons married to whole population of the State.					
.....	50.0	57.8	55.7	56.6	57.3

It will be perceived that marriages of the colored race have uniformly been of larger proportions than of the white, and that the fluctuations of the proportion from year to year have also been greater in the colored race.

## DIVORCES, 1880.

The number of applications for divorce reported from the different counties in Rhode Island in 1880 was 347. This number is 92 more than in 1879, and 89 more than in 1878.

During the year 1880, there were 273 applications for divorce granted, which were 27 more than in 1879, and 77 more than in 1878.

The following Table shows the number of applications for divorce, and the number granted, in 1880, in each county of the State; also the causes alleged for the applications. Full reliance cannot be placed in the causes alleged, the real causes no doubt being sometimes withheld:

TABLE XXXV.

COUNTIES.			CAUSES ALLEGED.						
	Number of Applications.	Number Granted.	Adultery.	Extreme Cruelty.	Wilful Desertion.	Continued Drunkenness.	Neglect to Provide Necessaries, &c.	Other Gross Misbehavior.	Impotency.
Bristol.....	10	8	3	2	7	2	5	5	...
Kent.....	28	28	5	2	6	2	13	...	...
Newport....	21	11	9	1	6	1	8	...	...
Providence .....	250	206	40	65	158	64	178	39	1
Washington.....	38	23	6	6	11	4	11	8	.....
Whole State.....	347	273	68	76	188	73	215	52	1

There are several different reasons alleged why divorce should be granted, in nearly every application. It will be noticed that the causes alleged in 347 applications in 1880, numbered 668. Of the 668 causes alleged 63 were for adultery; 76 for extreme cruelty; 188 for wilful desertion; 73 for continued drunkenness; 215 for neglect to provide necessaries of life; 52 for other gross misbehavior; and one for impotency.

There are every year applications or petitions for divorce which are not acted upon or continued until the case is closed, but are refused or granted in some following year.

In order to show the actual number of applications, and the number of divorces granted in each of the last eight years, the following summary is presented:

	Applications for Divorce.	Divorces Granted.	Applications refused or continued or withdrawn.
1873 .....	261.....	173.....	88
1874 .....	276.....	242.....	34
1875 .....	227.....	158.....	69
1876 .....	254.....	196.....	58
1877 .....	257.....	178.....	79
1878 .....	258.....	196.....	62
1879 .....	255.....	246.....	9
1880 .....	347.....	273.....	74
8 years total .....	2,135.....	1,662.....	478

The proportion of the number of divorces granted during the year 1880, to the number of applications for a decree of divorce was 78.6 per cent. This proportion is rather larger than the average of a series of years.

The number of applications for divorce in 1880 was an excessive increase over that of any preceding year.

The ratio of applications to the whole number of marriages during the year, was one application for divorce to less than every eight marriages.

The following Table shows the number of divorces granted in each county, and in the whole State, in each of the last twelve years, with the proportion of marriages to each divorce granted in each year:



TABLE XXXVI.

YEARS.	Bristol County.		Kent County.		Newport County.		Providence County.		Washington County.		Whole State.	
	Divorces Granted.	Marriages to one Divorce.	Divorces Granted.	Marriages to one Divorce.	Divorces Granted.	Marriages to one Divorce.	Divorces Granted.	Marriages to one Divorce.	Divorces Granted.	Marriages to one Divorce.	Divorces Granted.	Marriages to one Divorce.
1869.....	10	10.6	15	12.5	6	27.7	120	13.8	11	15.5	162	14.1
1870.....	8	27.7	18	11.8	6	26.3	152	11.8	21	9.3	200	11.8
1871.....	5	16.8	11	17.9	4	49.7	123	13.3	18	11.4	161	14.5
1872.....	8	10.2	13	15.7	8	22.9	149	12.6	22	8.9	200	12.7
1873.....	6	16.2	22	9.8	8	21.9	131	14.8	6	35.7	173	15.2
1874.....	10	8.9	20	8.0	6	29.0	190	10.0	16	11.6	242	10.5
1875.....	2	50.0	18	8.8	7	23.4	120	14.9	11	20.5	158	15.7
1876.....	6	14.5	15	12.8	7	20.5	148	11.1	20	8.8	190	11.5
1877.....	7	12.0	9	16.3	7	26.0	134	12.4	21	9.9	178	12.8
1878.....	4	26.0	11	13.3	13	12.8	156	10.9	12	17.3	196	11.9
1879.....	5	18.8	19	9.0	7	24.1	195	9.1	20	9.7	246	9.7
1880.....	8	12.1	23	9.4	11	17.6	208	9.7	23	17.0	273	10.1

It will be seen that the proportions of divorces granted to number of marriages, have varied very considerably in the different counties in the same year, and in the same county in different years. In Bristol county the proportion in 1874 was one divorce to every 8.9 marriages, and in the following year one divorce to every 50 marriages.

Newport county has had the smallest average proportion of any county in the State. During the last two years the proportions have been the largest in Kent county of any county in the State.

The proportion of divorces granted to whole number of marriages in the State, was slightly less in 1880 than in the previous year.

## DEATHS, 1880.

The number of deaths reported to the State Registrar as having occurred during the year 1880 was 4,829. It is much the largest number ever reported in the State. It exceeds that of 1879 by 357, and is larger than the number reported in 1878 by 388.

The rate of mortality as shown in the recapitulatory Table on page 14, was 17.5 decedents in each 1000 of the population, or one in every 57.2 persons. The rate is about one eighth of one per cent. larger than that of 1879.

It has been the practice in previous reports to contrast the number of deaths in the city of Providence with those that occurred in the rest of the State, for the purpose of showing the difference in the rate of mortality between city life under favorable circumstances, and life in villages and rural districts.

In order to bring before the eye in a more direct manner the comparisons alluded to, the following synopsis for the years 1878, 1879 and 1880 is presented:

	Population.	Number of Deaths.	One death in every	In each 1000.
1878.	Providence City.....	1,989	50.62	19.89
	Rest of State.....	2,452	64.26	15.56
	Whole State.....	4,441	58.10	17.20
1879.	Providence City.....	2,026	51.76	19.32
	Rest of State.....	2,446	70.25	14.02
	Whole State.....	4,472	61.87	16.20
1880.	Providence City.....	2,080	50.41	19.83
	Rest of State.....	2,749	62.45	16.00
	Whole State.....	4,829	57.36	17.50

The calculations for the years 1879 and 1880 are made on the basis of the revised census of 1880.

Upon a comparison of the different years, it will be seen that the difference in the death rates of Providence city and the rest of the State, in 1880, was less than in either of the two preceding years. In 1878 it was 4.33 in each thousand; in 1879, 5.30; and in 1880 3.83 in each thousand of the population.

The figures do not indicate that the conditions of living in the city of Providence, are greatly more unfavorable to continuance of life than in the rest of the State.

## SEX OF DECEDENTS.

Of the 4,829 persons whose deaths were returned during the year 1880, 2,366 were males, and 2,463 were females; the ratio standing at 96.06 males to each 100 females, or 48.96 males, and 51.04 females in each 100 decedents.

The following Tables, XXXVII. and XXXVIII., show the number and proportion of males and females among the decedents, and also among the children born in Rhode Island, during the ten years, 1853 to 1862 inclusive; also in each of the eighteen years from 1863 to 1880 inclusive, and for the entire period of twenty-eight years:

TABLE XXXVII.

DEATHS.	10 years, 1853-1862.....	10,930 males.....	11,269 females.....	or 96.9 males to 100 females.
	1863.....	1,621 males.....	1,586 females.....	or 102.2 males to 100 females.
	1864.....	1,633 males.....	1,727 females.....	or 94.5 males to 100 females.
	1865.....	1,686 males.....	1,719 females.....	or 98.1 males to 100 females.
	1866.....	1,497 males.....	1,473 females.....	or 101.6 males to 100 females.
	1867.....	1,443 males.....	1,447 females.....	or 99.7 males to 100 females.
	1868.....	1,418 males.....	1,499 females.....	or 94.3 males to 100 females.
	1869.....	1,696 males.....	1,686 females.....	or 100.6 males to 100 females.
	1870.....	1,588 males.....	1,650 females.....	or 96.2 males to 100 females.
	1871.....	1,621 males.....	1,723 females.....	or 94.1 males to 100 females.
	1872.....	2,118 males.....	2,129 females.....	or 99.4 males to 100 females.
	1873.....	2,166 males.....	2,237 females.....	or 95.5 males to 100 females.
	1874.....	2,111 males.....	2,118 females.....	or 99.7 males to 100 females.
	1875.....	2,108 males.....	2,209 females.....	or 95.4 males to 100 females.
	1876.....	1,969 males.....	2,147 females.....	or 91.7 males to 100 females.
	1877.....	2,133 males.....	2,318 females.....	or 92.0 males to 100 females.
	1878.....	2,161 males.....	2,280 females.....	or 94.8 males to 100 females.
	1879.....	2,183 males.....	2,289 females.....	or 95.4 males to 100 females.
	1880.....	2,366 males.....	2,463 females.....	or 96.0 males to 100 females.
	28 years.....	44,441 males.....	45,969 females.....	or 96.7 males to 100 females.

TABLE XXXVIII.

BIRTHS.	10 years, 1853-1862.....	18,377 males.....	17,260 females.....	or 106.4 males to 100 females.
	1863.....	1,892 males.....	1,788 females.....	or 105.8 males to 100 females.
	1864.....	1,949 males.....	1,942 females.....	or 100.3 males to 100 females.
	1865.....	2,096 males.....	1,857 females.....	or 112.9 males to 100 females.
	1866.....	2,546 males.....	2,356 females.....	or 108.1 males to 100 females.
	1867.....	2,655 males.....	2,464 females.....	or 107.7 males to 100 females.
	1868.....	2,745 males.....	2,627 females.....	or 104.5 males to 100 females.
	1869.....	2,685 males.....	2,560 females.....	or 104.9 males to 100 females.
	1870.....	2,679 males.....	2,536 females.....	or 105.6 males to 100 females.
	1871.....	2,878 males.....	2,800 females.....	or 102.8 males to 100 females.
	1872.....	3,065 males.....	3,058 females.....	or 100.9 males to 100 females.
	1873.....	3,135 males.....	2,887 females.....	or 108.6 males to 100 females.
	1874.....	3,311 males.....	3,155 females.....	or 104.9 males to 100 females.
	1875.....	3,362 males.....	3,146 females.....	or 106.9 males to 100 females.
	1876.....	3,291 males.....	3,088 females.....	or 106.3 males to 100 females.
	1877.....	3,163 males.....	3,072 females.....	or 103.0 males to 100 females.
	1878.....	3,402 males.....	3,312 females.....	or 102.7 males to 100 females.
	1879.....	3,259 males.....	3,091 females.....	or 105.4 males to 100 females.
	1880.....	3,241 males.....	3,054 females.....	or 106.1 males to 100 females.
	28 years.....	69,751 males.....	66,008 females.....	or 105.7 males to 100 females.

An inspection of Table XXXVII. will show that during a period of ten years previous to 1863, the number of female decedents exceeded the male decedents by about an average of three per cent. each year, and that during the eighteen following years the rule then apparently established has held good, the exceptions being simply confirmatory, the average only being slightly less.

But at the same time that the records of death have shown an excess of mortality in the female sex, the records of birth have shown an excess of births of the male sex.

This would naturally lead to the supposition that the number of the male sex must be increasing and *vice versa*.

By reference to Table VII., on page 14, it will be seen that by the census of 1880 the population of the State by the sexes was as follows:

Males.....183,080      Females.....143,501

This will show an excess of 10,471 females in the general population.

It is obvious that there is either a larger proportional immigration of females, or a larger proportional emigration of native males from the State, to account for the difference. Probably the fact, is the result of both circumstances.

The excess of female population would account for the excess of mortality in numbers of the female sex.

#### SEASON AND MORTALITY.

The whole number of decedents, and the sex of the same, in each month of the year 1880, and in each division of the State, may be found in Table VI., on the ninth page.

The influence of season upon mortality may be further illustrated by the following Table, which shows the number and percentage of deaths in each quarter of each of the last five years, and in the aggregate for the twenty-five years from 1853 to 1877 inclusive:

TABLE XXXIX.

SEASON.	1880.		1879.		1878.		1877.		1876.		1853-1877.	
	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
January-March....	1,316	25.18	1,185	26.49	1,158	25.87	936	21.03	948	23.03	17,646	22.16
April-June.....	1,149	23.80	939	20.99	968	21.31	954	21.53	942	22.89	16,513	20.74
July-September...	1,306	27.04	1,174	26.26	1,175	26.46	1,317	29.60	1,249	30.34	23,464	29.46
October-December	1,158	23.96	1,174	26.26	1,140	25.86	1,329	27.84	977	23.74	22,006	27.64
Total.....	4,839	100.00	4,472	100.00	4,441	100.00	4,450	100.00	4,116	100.00	79,629	100.00

The percentages of the different quarters of the year 1880, vary considerably from the corresponding quarters of 1879. The mortality of the first quarter of 1879 was the largest in the year, contrary to the rule established by twenty-eight years of registration. The first quarter has in nearly every year, been the third in the percentage of mortality, but in 1880 it holds the second place. The percentage of the first two quarters in 1880 is considerably more than the yearly average of a period of twenty-five years, and that of the last two quarters considerably less than the yearly average of the same period.

The question of the influences of city life upon the status of mortality is often presented, and it has been the custom in former Reports to contrast the city of Providence, which comprises about three-eighths of the entire population of the State, with the rest of the State, in regard to the influence of *season* upon mortality.

The following Table will present a comparison between the city and the rest of the State, in relation to the mortality of each section by seasons. It will show the number and percentage of deaths in each quarter of the year 1880 in the city, and in the rest of the State separately; and also the percentage of deaths in each quarter of the year in the city of Providence, for twenty-five years, from 1855 to 1879 inclusive; and in the whole State, including the city, for twenty-seven years, from 1853 to 1879 inclusive:

TABLE XL.

SEASON.	1880.				1855-1879.		1853-1879.	
	Providence.		Rest of State.		Providence.		Whole State.	
	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
January-March.....	560	26.92	656	23.86	8,038	23.99	20,190	24.55
April-June.....	588	25.68	616	22.04	7,348	21.94	18,630	21.59
July-September.....	525	25.24	781	28.41	9,846	29.40	25,945	30.17
October-December.....	462	22.21	696	25.69	8,263	24.67	21,304	23.69
Total.....	2,080	100.00	2,749	100.00	33,490	100.00	85,999	100.00

Contrary to the rule established by twenty-five years registration in the city of Providence, the percentage of the first quarter of the year 1880 was the largest in the year. The third quarter, which is usually the largest in percentage of mortality, as before observed, was smaller than either the first or second. The great prevalence and severe form of an epidemic of scarlatina during the early months of the year, doubtless contributed largely to that result.

In the rest of the State, the prevailing order of a long period of years was sustained.

The difference in percentage of mortality between the city and the rest of the State, in each of the different quarters of the year 1880, as will be noticed, are quite considerable, varying more than three per cent. in the first, third and fourth quarters.

#### ORDER OF MONTHS.

Below may be found a general view of the order of the months, in which occurred from the largest to the smallest number of deaths, in the whole State, in each of the last five years:

TABLE XLI.

1880.	1879.	1878.	1877.	1876.
1. July. .... 488	January. .... 468	December.... 421	September. . 454	August. .... 460
2. August. .... 480	August. .... 452	August. .... 490	August. .... 460	July. .... 444
3. March. . . . 496	December.... 395	July. .... 410	October. .... 420	December.... 348
4. January. . . 422	October. .... 391	January. .... 400	July. .... 413	March. .... 341
5. October. .... 416	November.... 388	March. .... 396	December.... 411	September. . 336
6. April. .... 400	July. .... 383	November.... 377	November.... 398	October. .... 334
7. May. .... 392	March. .... 382	February.... 362	March. .... 347	May. .... 332
8. September.. 388	April. .... 342	April. .... 350	May. .... 343	April. .... 339
9. December.. 377	September.... 339	September.... 345	January. .... 323	February.... 312
10. February.. 368	February.... 335	October. .... 342	April. .... 310	January. .... 295
11. November.. 365	May. .... 318	June. .... 310	June. .... 305	November.... 295
12. June. . . . 357	June. .... 279	May. .... 308	February.... 266	June. .... 261
4,829	4,472	4,441	4,450	4,116

It will gratify the curiosity of those having a fondness for studying the fluctuations of the death rate in the different months of the year, to observe their occurrence as shown in Table XLI. August, which for a long period was the first in the order of largest mortality, has fallen to the second place in the list during the last four years. June is the only month in the year which has sustained its place on the list without large change.

#### PARENTAGE OF DECEDENTS.

The whole number of decedents reported in Rhode Island in 1880 was 4,829, of which 2,517 were of American parentage, and 2,312 were of foreign parentage. The parentage was reckoned according to the reported nativity of the fathers.

The parentage of the decedents in the two classes of American and foreign, as reported from the different towns in the State, may be found in the general abstract for 1880, on the second and third pages.

There were no decedents of foreign parentage, in 1880, reported from the following seven towns, viz.: West Greenwich, Jamestown, Little Compton, Middletown, New Shoreham, Foster and Charlestown.

The decedents of foreign parentage in the following six towns, numbered four or less, viz.: Barrington, Coventry, Portsmouth, Exeter, Hopkinton and Richmond.

The towns in which the number of decedents of foreign parentage exceeded those of American parentage, were as follows, viz.: Burrill-

ville, Cranston, Cumberland, Lincoln, North Providence, North Smithfield, Pawtucket, Woonsocket and Providence.

In Cumberland there were nearly twice as many decedents of foreign parentage reported as there were of American; in Woonsocket nearly three times as many; and in Lincoln more than three times as many.

The following Table gives the number and percentage of decedents of American and of foreign parentage, in each of the last five years; and in the aggregate for twenty-two years, or from 1858 to 1879 inclusive:

TABLE XLII.

PARENTAGE.	1880.		1879.		1878.		1877.		1876.		1858-1879.	
	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
American.....	2,517	52.13	2,294	51.29	2,281	51.36	2,279	51.21	2,150	52.24	53,332	56.25
Foreign .....	2,312	47.87	2,178	48.71	2,160	48.64	2,171	48.79	1,966	47.76	40,702	43.75
Total.....	4,829	100.00	4,472	100.00	4,441	100.00	4,450	100.00	4,116	100.00	93,034	100.00

It will be seen by Table XLII., that the decedents of American parentage have been steadily losing in the proportion to the whole number, from year to year, until in 1880 there was a slight gain, not reaching one per cent.

On the other hand, the decedents of foreign parentage have been steadily increasing in percentage as well as numbers, except as just stated.

Previous to 1874, the percentage of decedents of foreign parentage had averaged, during a period of seventeen years, less than 41.00 per cent. An examination of the above Table will show that the average proportion of the same parentage during the last four years, is 48.5 per cent. The proportional average of decedents of American parentage, during the same four years, is 51.5 per cent., while the average of decedents of the same parentage, during a period of seventeen years previous to 1874, was 58.28 per cent.

It should be borne in mind that the term "foreign parentage," as made use of above, does not mean that the decedents were all foreign born, but includes the foreign born, and all those whose fathers were of foreign birth, though of themselves American born.

It will thus be seen that as the population by foreign parentage in-



creases, the death rate must also increase. But the percentage of mortality, under the term "foreign parentage," must, in a few years, decline, because the children born in the United States of foreign parents are rapidly reaching the adult age, and as they become parents, their children will be classed as of American parentage.

#### AGE OF DECEDENTS.

There may be found on pages two and three, in Table I., the aggregate and average age of all the decedents of each sex, in each town and county in the State.

There may also be found in Table VII., pages ten to fifteen inclusive, the number of each sex in each division of ages or periods of life, as reported from each town and county during 1880.

It will be seen by Table I. that the average age of all the male decedents in the State, in 1880, was 29.62 years; and the average age of all the female decedents during the same year was 32.06 years. The average age of both sexes was less than in 1879, and larger than in 1878, as will be seen in the following summary of the three years:

	1880.	1879.	1878.
	Average.	Average.	Average.
Males.....	29.62 years.....	31.29 years.....	29.02 years.
Females.....	32.06 years.....	33.24 years.....	31.11 years.
Age of all.....	30.86 years.....	32.29 years.....	30.00 years.

The highest average age of male decedents in any town in the State, in 1880, was 82 years, in New Shoreham; the highest average age of female decedents was 58.62 years, in Middletown.

The lowest average age of male decedents during the same time was 16.38 years, in Lincoln, and the lowest average age of female decedents was 18.64 years, in Woonsocket.

The fallacy of dependence on the average age of decedents reported from any town of small population in single years, has been adverted to in previous Reports, and will be readily apparent to any one upon a moment's attention.

When, however, the results of a series of years are aggregated and averages made, a basis is obtained for approximate conclusions as to the relative longevity of the inhabitants of any town furnishing such statistics.

The aggregate and average age of all the decedents in each town and county in the State, for a period of ten years, will be seen in Table XV.

The larger the population of any town, the nearer the approximation of the average age of all its decedents in each and every year, to the average age of all the decedents in the State.

The following summary will show the average age of the decedents in the city of Providence, during 1878, 1879 and 1880:

	1880.	1879.	1878.
	Average.	Average.	Average.
Males.....	28.73	28.09	24.23
Females.....	30.45	29.54	27.88
Age of all...	29.67	28.82	26.09

The following Table shows the average age of the decedents in each of the larger divisions of the State, in each of the last five years, and also in the aggregate of each of four periods of five years each, comprising the twenty years from 1858 to 1877 inclusive:

TABLE XLIII.

DIVISIONS OF THE STATE.	1880.	1879.	1878.	1877.	1876.	1873-1877. 5 years.	1868-1873. 5 years.	1863-1867. 5 years.	1858-1862. 5 years.
Bristol County....	26.43	40.87	29.06	22.19	29.53	33.61	35.13	34.78	35.56
Kent County.....	26.54	35.15	33.68	35.78	29.39	26.90	34.77	35.81	32.15
Newport County.....	42.38	37.62	39.06	43.96	39.17	40.68	40.04	33.54	35.01
Providence Co., Towns.	27.40	32.45	30.98	28.16	31.69	28.46	25.26	29.16	28.44
Providence City.....	29.67	28.82	26.09	27.74	28.41	27.19	25.45	28.50	25.78
Washington County...	37.82	43.44	42.34	43.68	43.09	41.14	39.67	30.87	34.21
Whole State .....	30.86	32.29	30.09	30.45	32.37	30.28	31.66	30.75	29.42

By the above it appears Bristol county has lost the high average age it showed in 1879, and steps back nearer the average of a series of years. Newport county shows a higher average, and also Providence city. Washington county has almost invariably shown the highest average of any section of the State, but is now surpassed by Newport county.

The average age of all the decedents in the State, in 1880, is somewhat less than in 1879. It is, however, more nearly the general average of a considerable number of years.

#### PERCENTAGES OF DECEDENTS AT DIFFERENT AGES.

In Table VII., on pages 10 to 15 inclusive, will be found the number of deaths in 1880, in each town and each county, of each sex, and in each period of life, with the percentage of the whole number of deaths in each division to the population of the same.

The following Table shows the percentages of decedents in each division of ages to whole number of deaths, in each of the last nine years, and in the aggregate for two periods; one of ten years and seven months, from June 1st, 1852, to December 31st, 1862, inclusive; the other of ten years, from 1863 to 1872 inclusive:

TABLE XLIV.

PERIODS OF LIFE.	1880.	1879.	1878.	1877.	1876.	1875.	1874.	1873.	1872.	10 y'rs. 1863 to 1872.	10 y'rs. 7 m'hs. 1852 to 1862.
Under 1 year.....	18.4	16.1	16.6	17.4	19.5	20.8	19.9	19.3	22.8	18.0	17.6
1 and under 2.....	7.0	6.8	8.1	8.1	7.4	6.8	7.8	9.2	8.0	7.8	9.8
2 and under 5.....	9.2	10.1	10.3	9.5	7.0	7.0	9.4	8.1	5.5	7.9	9.6
Total under 5.....	34.6	33.0	35.0	35.0	33.9	34.6	37.1	36.6	36.3	33.7	37.0
5 and under 10....	6.2	6.3	6.2	6.2	4.9	4.0	5.7	5.3	2.7	4.6	5.0
10 and under 20....	4.8	4.8	6.1	5.4	5.2	5.5	6.0	6.9	6.5	6.2	5.8
20 and under 30....	8.6	8.8	8.8	8.9	9.1	9.6	8.7	9.1	9.9	9.7	9.5
30 and under 40....	7.6	7.4	7.6	7.5	7.7	7.9	6.9	7.8	8.5	8.1	8.7
40 and under 50....	6.6	6.5	6.4	6.6	6.9	7.7	6.8	6.5	7.3	7.2	7.5
50 and under 60....	6.7	7.1	7.6	7.2	7.5	7.4	7.0	6.4	6.7	7.3	6.7
60 and under 70....	8.5	10.0	7.9	8.8	9.3	8.6	7.8	7.6	8.2	8.2	6.9
70 and under 80....	9.4	9.0	8.8	9.5	9.8	8.4	8.1	8.3	7.7	8.4	7.3
80 and under 90....	5.7	5.5	4.8	4.0	5.2	5.0	4.7	4.5	5.4	5.4	4.6
Over 90 and not stated	1.8	1.6	0.8	0.9	1.2	1.3	1.2	1.0	0.8	1.1	1.0
Total.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

An inspection of the foregoing Table will show, that the percentage to whole mortality during the year 1880, was larger in the period of life under one year than during any one of the three previous years. The total percentage under five years was also larger than during 1879, but was at the same time less than the annual average of twenty-eight years. It has been noticed during the last four years, that diarrhoeal diseases among children, and especially cholera infantum, have been less prevalent than in former years.

It may be of interest to see what changes have occurred in the percentages of mortality from cholera infantum, from year to year, since and including 1875.

## PERCENTAGES OF MORTALITY FROM CHOLERA INFANTUM.

	1875.	1876.	1877.	1878.	1879.	1880.
Rhode Island, {	7.74	6.41	6.08	3.97	3.81	5.43

It will be seen by the above comparisons, that cholera infantum has prevailed only to greatly lessened extent during the last three years, although there was an increase during 1880.

Doubtless this factor alone has a large share in the lessened percentage of mortality in young children, during 1878 and 1879.

To show some of the strong contrasts of death rates, in the different divisions of age, in different sections of the State, the following summary is presented. It will be understood that the percentages are the proportion of deaths in each division of age, to the total deaths in each town or city taken.

	Under 1 year.	Under 5 years.	5 to 20.	20 to 50.	50 and over.
1880.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Whole State	18.4	34.6	11.0	23.3	31.6
Providence City	18.3	35.3	11.0	25.5	28.3
Woonsocket	37.0	53.5	9.7	18.3	18.6
Lincoln	35.0	52.1	13.3	16.5	18.1
Foster	00.0	10.0	00.0	24.0	66.0
Jamestown	00.0	00.0	00.0	50.0	50.0
Little Compton	00.0	00.0	6.6	20.0	73.4

The great difference in the percentages of decedents under one year of age in different towns, is strikingly shown in the above summary.

The large proportion of more than one quarter of all the deaths in Woonsocket, occurring in children under one year of age, is not unprecedented in that town, it having occurred for three years in succession. It will be seen that Lincoln has also a death proportion of one quarter under one year, which is less than during some previous years, while Providence city has only a proportion of 18.3 per cent., and some towns with not a single death of persons under one year. The occurrence of more than half of all the deaths, in the period of life under five years of age, in Woonsocket and Lincoln, would seem to be evidence that there was not only a very large percentage of the population of that age, but that there was a great lack of vital force, or inherited or acquired physical defect in that class, either from prenatal influences in parentage, or improper management in infancy and early childhood, the result of ignorance and indifference on the part of parents and guardians. The city of Providence shows a proportion of 35.4 per cent. of decedents under five years of age, the

town of Foster 10.0 per cent., the towns of Jamestown and Little Compton no deaths under five. It will be understood that the birth rate is small in those towns, and the proportion of children small.

#### COLORED DECEDENTS.

The statistics of the colored population of Rhode Island are always included in the general statistics of the State. But on account of several questions of considerable importance, the statistics of births, marriages and deaths have been separately considered. This has seemed to be of more consequence in Rhode Island, because the number of this class of the people is larger, proportionally, than in most northern States.

The number of deaths reported in 1880 among the colored population was 153. The number is 15 less than in 1879, and 3 less than in 1878. They occurred in the different towns as follows:

Providence City.....	96
Newport City.....	28
East Greenwich.....	8
Bristol.....	6
Warwick.....	5
Cranston.....	4
Warren, { 2 each.....	4
East Providence. }	
Johnston and { 1 each.....	2
Pawtucket, }	
Total.....	153

*Sex.*—Of the 153 colored decedents, 70 were males and 83 females.

*Season.*—These 153 deaths were in the different months, as follows:

Months.	Deaths.	Months.	Deaths.	Months.	Deaths.	Months.	Deaths.
January. . . . .	9	April. . . . .	9	July. . . . .	14	October. . . . .	8
February. . . . .	12	May. . . . .	23	August. . . . .	18	November. . . . .	17
March. . . . .	13	June. . . . .	14	September. . . . .	7	December. . . . .	11
—	—	—	—	—	—	—	—
1st Quarter. . . . .	33	2d Quarter. . . . .	45	3d Quarter. . . . .	39	4th Quarter. . . . .	36

First six months, 78; second six months, 75. Total, 153.

*Age.*—The average age of the colored decedents in Rhode Island, in 1880, was as follows:

	Providence City.	Rest of State.	Whole State.
Colored males.....	26.5 years	27.4 years	26.9 years.
Colored females.....	34.0 years	42.8 years	37.8 years.

## SUMMARY OF COLORED POPULATION : INCLUDING ALL NATIVITIES.

The number of births, marriages and deaths among the colored population of Rhode Island, in the several divisions of the State, in 1880, is given in the following Table, compared with the colored population in each division, as found by the United States Census of 1880.

TABLE XLV.

COUNTIES.	Colored Population, 1880.	BIRTHS, 1880.		MARRIAGES, 1880.		DEATHS, 1880.	
		Number.	To population one birth in	Number.	Of population, one person married in	Number.	Of population, one death in
Bristol County.....	209	4	53.2	2	52.2	8	26.1
Kent County.....	330	11	30.0	4	41.2	13	25.4
Newport County.....	1,129	20	56.4	8	70.0	28	40.3
Providence County, Towns....	496	9	55.1	2	124.0	8	62.0
*Providence City.....	3,646	87	41.9	57	32.0	96	38.0
Washington County .....	782	9	87.0	3	130.0	0	00.0
Whole State.....	6,592	140	47.1	76	43.3	158	44.0

In 1878 the proportions of the above events in the whole State, among the colored population, were as follows: One birth in every 36.4; one person married in every 39.2; and one death in every 40.2.

In 1879 the proportions were: One birth in every 39.6; one person married in every 51.4; one death in every 37.3.

In 1880, as will be seen in the above Table, the proportions were: One birth in every 47.1; one person married in every 43.3; and one death in every 44.0 persons of color.

During the last three years, the proportion of colored births to colored population has gradually grown less; the proportion of colored persons married has also grown less; and the proportion of deaths to population, which was 2.5 per cent., or 25 in each thousand, in 1878,

\* Including 64 not of African descent.

advanced to 2.7 per cent., or 27 in each thousand in 1879; and receded to 2.3 per cent., or 23 in each thousand in 1880, based upon the Census of that year.

The difference in the vital statistics between the white and the colored population, in 1880, may be presented as follows:

White... One child born in every 43.8; one person married in every 50.2; one death in every 57.7.

Colored.....One child born in every 47.1; one person married in every 43.3; one death in every 44.0.

Whole No. }  
white and } One child born in every 48.9; one person married in every 49.9; one death in every 57.3.  
colored. }

Allowance should be made for the difference in the number of colored persons in the State, upon which the foregoing calculations are based; those of 1878 and 1879 are upon the Census of 1875, and those of 1880 upon the Census of 1880, which makes the colored population larger by 321 persons.

In 1880, the proportions of births, and of persons married in this class, to its population, were smaller than in the white population, while the proportion of deaths to its population was considerably larger than among the whites.

The following summary shows the number of births, marriages and deaths among the colored population of Rhode Island, in each of the last twenty years, from 1861 to 1880 inclusive:

#### COLORED POPULATION.

1861.....	97 births.....	30 marriages.....	109 deaths.
1862.....	96 births.....	28 marriages.....	90 deaths.
1863.....	73 births.....	68 marriages.....	104 deaths.
1864.....	69 births.....	35 marriages.....	121 deaths.
1865.....	87 births.....	51 marriages.....	120 deaths.
1866.....	124 births.....	65 marriages.....	123 deaths.
1867.....	144 births.....	61 marriages.....	106 deaths.
1868.....	147 births.....	84 marriages.....	111 deaths.
1869.....	136 births.....	70 marriages.....	133 deaths.
1870.....	158 births.....	70 marriages.....	128 deaths.
1871.....	146 births.....	64 marriages.....	116 deaths.
1872.....	171 births.....	76 marriages.....	184 deaths.
1873.....	163 births.....	69 marriages.....	180 deaths.
1874.....	170 births.....	80 marriages.....	151 deaths.
1875.....	156 births.....	76 marriages.....	169 deaths.
1876.....	170 births.....	59 marriages.....	156 deaths.
1877.....	168 births.....	64 marriages.....	160 deaths.
1878.....	172 births.....	80 marriages.....	156 deaths.
1879.....	159 births.....	61 marriages.....	168 deaths.
1880.....	140 births.....	76 marriages.....	153 deaths.
Total.....	2,746 births.....	2,362 marriages.....	2,736 deaths.

The number of colored births in 1880 were less than in any year since 1866, and seem to be gradually growing less in number, while the colored population has increased slightly by immigration, and consequently the percentage has grown considerably smaller. The number and percentage of deaths were smaller than usual. During a period of twenty years the number of births have exceeded the number of deaths by twenty only.



## CAUSES OF DEATH, 1880.

The statistics of the causes of death in Rhode Island, in 1880, will be found in Tables VIII., IX., X. and XII. The whole number of deaths, as previously stated, was 4,829. The number of which the cause of death was reported was 4,596, and the number of which the cause was not stated was 233. The number from unknown causes was 21 less than in 1879.

The following Table shows the number of deaths in 1880, in each larger division of the State, and the number and proportion in each division, of which the cause was unknown:

TABLE XLVI.

1880.	Bristol County.	Kent County.	Newport County, Towns.	Newport City.	Providence County, Towns.	Providence City.	Washington County.	Whole State.
Number of deaths.....	219	306	107	243	1,568	2,060	286	4,829
Cause not stated. ....	10	18	2	24	151	17	16	233
One in.....	21.9	23.5	53.5	10.1	10.5	122.3	17.8	20.7

A decided improvement in the completeness of the returns of deaths in the different divisions of the State during 1880, is shown by the lessened number of deaths reported with the cause of death unknown. This improvement is seen in nearly all the divisions and in the whole State, but it is far from being satisfactory. In the Report for 1879 it was remarked "That the returns of the *causes* of deaths are manifestly more *unnecessarily* incomplete than any other of the vital statistics of the State. That the *cause* of death in one out of every 17 or 18 of the decedents in the State should be returned as unknown, is positive evidence that there is a defect in the Registration law, as well as proof that there is neglect of duty on the part of those who should observe the law as it stands. The remedy is in the enactment of a law for the State such as is provided by municipal ordinance in

the city of Providence, that is, the requirement of burial permits, and the pre-requirement of return of death, and *cause* of death when known." It will be futile to expect any very complete returns of all the circumstances connected with each death, until such a law is enacted and enforced.

TABLE XLVII.

*Showing the proportion of deaths reported, with "cause unknown," in each Division of the State, and in the whole State, in each of the last eighteen years, from 1863 to 1880 inclusive.*

YEARS.	Bristol County.	Kent County.	Newport County.	Providence County Towns.	Providence City.	Washington County.	Whole State.
1863, One in.....	16.5	11.3	25.5	6.9	46.7	24.7	14.7
1864, One in.....	57.0	12.6	11.6	8.5	45.7	47.6	16.1
1865, One in.....	64.3	27.4	13.4	8.2	55.0	32.9	16.4
1866, One in.....	163.0	11.4	22.4	9.5	45.0	23.3	17.3
1867, One in.....		13.6	34.5	7.4	64.0	14.3	14.8
1868, One in.....	33.2	5.0	20.3	5.2	46.2	10.1	10.1
1869, One in.....	41.2	5.8	52.8	5.3	33.6	16.1	11.3
1870, One in.....		19.3	23.6	11.8	90.2	26.9	23.6
1871, One in.....	151.0	81.2	7.9	8.4	33.6	9.8	13.0
1872, One in.....	13.3	5.8	10.0	6.8	72.8	9.8	11.3
1873, One in.....		16.0	25.4	9.8	102.5	27.5	20.3
1874, One in.....	54.0	15.2	14.0	17.2	73.7	21.2	27.8
1875, One in.....	55.0	7.4	15.6	13.7	91.2	11.9	20.9
1876, One in.....	11.5	7.9	18.5	9.9	124.3	22.8	19.3
1877, One in.....		17.7	9.7	11.9	323.0	16.0	23.2
1878, One in.....	32.1	7.4	9.0	13.7	124.2	21.7	21.1
1879, One in.....	16.6	9.2	12.4	9.5	225.1	8.6	17.6
1880, One in.....	21.9	23.5	13.5	10.5	122.3	17.8	20.7

It seems hardly possible that such great variations in the number of decedents, the cause of whose death is unknown to physician or acquaintance, could occur from year to year, as shown in Table XLVII.

In Bristol county, for instance, in four of the eighteen years the cause of death was given in every return, while in one of the eighteen years the cause of death was returned unknown in one out of every 11.5 decedents.

In Kent county, the smallest proportion of deaths reported from cause unknown, during eighteen years, was in 1871; that is, one in every 81.2, or about 1.2 per cent. The largest proportion was in 1868; that is, one in every 5, or 20 per cent. The proportion is smaller for 1880 than for any one of the previous eight years.

Newport county, including the city of Newport, shows a general average of one death from cause unknown to every 13.5 of the decedents, or about 7.4 per cent. In the city of Newport, in 1878, the proportion was about 14 per cent.; while in the towns of Newport county it was only about 2.6 per cent. In 1879 there was less disparity of proportion between the city and county towns, but the proportion in the city was in that year more than twice as large, and in 1880 more than five times as large. Comments are needless.

The towns in Providence county have always shown a large number of deaths returned with cause unknown. The proportions have invariably been large, and therefore have varied less than any other division. The smallest proportion was in 1874; that is, about six per cent.; and the largest in 1868, which was about 20 per cent.

Providence city is a very good example of what may be accomplished by a "burial permit" law, properly enforced. During a period of eighteen years, the largest proportion of deaths returned with cause unknown was one in every 45.0, in 1866; and the smallest, one in every 323, in 1877.

In Washington county, the proportion of deaths reported from cause not known was the largest in 1879 of any one of the previous sixteen years, that is, one in every 8.6 decedents, or nearly twelve per cent. In 1880 it was one in every 17.8, or 5.6 per cent.

The proportion in the whole State, one in every 20.7 decedents, or 4.8 per cent., is somewhat less than that of 1879.

#### PRINCIPAL CAUSES OF DEATH.

The following Table gives the number of deaths in Rhode Island, from each of thirteen principal causes, showing the order in regard to number, in each of the last three years, and also in the aggregate of deaths for twenty-five years and seven months, from June 1st, 1852, to December 31st, 1877:

TABLE XLVIII.

*Showing the order in regard to number of decedents from thirteen principal causes of death.*

1880.	1879.	1878.	June 1st, 1852, to Dec. 31st, 1877—25 yrs. 7 mos.
Whole Number... 4,829	Whole Number... 4,473	Whole Number... 4,441	Whole Number..... 77,390
Consumption..... 642	Consumption..... 637	Consumption..... 676	Consumption..... 12,627
Scarlatina..... 468	Pneumonia and Conges. of Lungs 311	Diphtheria..... 435	Pneumonia and Conges. of Lungs. 4,436
Pneumonia and Conges. of Lungs 364	Scarlatina..... 311	Pneumonia and Conges. of Lungs 317	Old Age.... 4,163
Old Age..... 273	Diphtheria..... 259	Old Age..... 222	Cholera Infantum.. 4,002
Cholera Infantum . 247	Apoplexy and Paralysis..... 220	Cholera Infantum.. 168	Scarlatina..... 3,350
Heart, Diseases of.. 231	Old Age..... 220	Heart, Diseases of.. 166	Fevers, Typhoid, &c..... 2,952
Apoplexy and Paralysis..... 215	Heart, Diseases of.. 202	Fevers, Typhoid, &c..... 150	Heart, Diseases of.. 2,829
Fevers, Typhoid, &c..... 158	Cholera Infantum.. 161	Accidents (all kinds)..... 122	Apoplexy and Paralysis..... 2,579
Diphtheria..... 132	Cancer (all kinds).. 125	Cancer (all kinds).. 119	Accidents (all kinds)..... 2,349
Accidents..... 137	Fevers, Typhoid, &c..... 123	Convulsions and Fits..... 112	Dysentery..... 1,975
Convulsions, &c... 133	Convulsions, &c... 104	Apoplexy and Paralysis..... 102	Convulsions and Fits..... 1,642
Cancer..... 126	Accidents..... 102	Croup..... 93	Croup..... 1,580
Debility..... 118	Croup..... 96	Scarlatina..... 86	Diphtheria..... 1,783

With the exception of Consumption, no disease or cause of death maintains its place in the order of number from year to year.

Consumption, as in all previous years, stands at the head of the list in formidable numbers and proportion, as the most active agent of death.

It is of some interest to note the changes that occur from one year to another, in regard to the number of deaths, and place on the list, of the twelve principal causes of death following Consumption, as shown in Table XLVIII.

Scarlatina, which will be seen at the foot of the list in 1878, rose to third place in 1879, and to second place in 1880, with a proportion

of more than one tenth of all the specified causes of deaths in that year.

Diphtheria, which was second in the list in 1878, was fourth in 1879, and ninth in 1880.

Croup, which has had a place on the list in every previous year, has during 1880 been displaced by Debility, which is a rather indefinite term as a cause of death, and in many instances is doubtless returned as a name to cover real organic diseases of a chronic character not well understood.

TABLE XLIX.

*Showing the Deaths in Rhode Island, in 1880, from Sixteen Principal Causes.*

	Accidents.	Apoplexy and Paralysis.	Brain, Diseases of.	Cancer.	Cholera Infantum.	Consumption.	Croup.	Diarrhoea.	Diphtheria.	Dysentery.	Fever, Typhoid, &c.	Heart, Diseases of.	Hooping Cough.	Old Age.	Pneumonia and Congestion of Lungs.	Scarlatina.
Whole Number.....	137	215	161	125	247	642	60	70	152	28	158	231	20	273	364	468
{ Males.....	101	109	87	45	123	287	32	34	73	15	74	125	10	121	180	215
{ Females.....	36	106	74	80	124	355	34	36	79	13	84	106	10	152	184	253
{ American.....	52	157	87	73	109	287	27	31	75	19	94	146	7	186	177	216
{ Foreign.....	85	58	74	52	138	355	39	39	77	9	64	85	13	87	187	252
PAR'AGE.																
January.....	12	21	27	11	.....	49	9	.....	17	.....	5	24	1	25	35	75
February.....	12	8	9	5	2	55	5	1	11	.....	8	28	1	23	28	55
March.....	8	20	11	5	.....	64	5	3	11	.....	12	19	1	34	54	54
April.....	8	15	13	7	4	63	5	3	11	3	8	20	.....	20	52	44
May.....	16	19	19	13	5	44	.....	1	8	1	10	18	2	23	42	51
June.....	13	15	9	13	16	39	1	3	8	5	11	13	3	24	31	31
July.....	13	17	16	7	107	54	2	23	11	6	6	13	.....	19	13	32
August.....	12	14	12	18	57	54	.....	15	9	7	12	16	2	24	11	28
September.....	11	13	10	8	34	58	7	15	19	2	24	15	2	13	12	19
October.....	15	30	11	11	17	59	5	2	18	4	34	14	.....	30	31	24
November.....	9	24	8	12	4	54	19	2	12	.....	17	26	3	18	25	29
December.....	8	19	16	15	1	49	8	2	17	.....	11	20	5	20	30	26
SEASON.																

TABLE XLIX.—Continued.

*Showing the Deaths in Rhode Island, in 1880, from Sixteen Principal Causes.*

LOCALITY.	AGES.																
	Accidents.	Apoplexy and Paralysis.	Brain, Diseases of.	Cancer.	Cholera Infantum.	Consumption.	Croup.	Diarrhea.	Diphtheria.	Dysentery.	Fevers, Typhoid, &c.	Heart, Diseases of.	Hoopling Cough.	Old Age.	Pneumonia and Congestion of Lungs.	Scarlatina.	
{ Under 5 years. . . . . 5 and under 10. . . . . 10 " " 15. . . . . 15 " " 20. . . . . 20 " " 30. . . . . 30 " " 40. . . . . 40 " " 50. . . . . 50 " " 60. . . . . 60 " " 70. . . . . 70 " " 80. . . . . 80 and over. . . . . Not stated. . . . . }	28	1	96	.....	247	30	53	47	86	13	19	7	19	....	95	291	
	19	.....	15	.....	.....	3	12	1	42	1	6	2	1	.....	18	139	
	7	.....	2	.....	.....	14	1	1	14	.....	12	3	.....	.....	3	21	
	6	.....	2	.....	.....	44	.....	.....	6	1	24	3	.....	.....	16	6	
	16	2	5	4	.....	199	.....	.....	3	1	43	10	.....	.....	14	9	
	16	8	5	18	.....	135	.....	1	1	.....	23	18	.....	.....	33	...	
	19	18	8	18	.....	82	.....	.....	.....	2	12	23	.....	.....	37	1	
	19	21	5	25	.....	50	.....	2	.....	3	10	38	.....	.....	46	1	
	5	59	8	29	.....	55	.....	10	.....	3	5	49	.....	.....	1	47	...
	9	70	9	25	.....	20	.....	4	.....	3	3	49	.....	.....	88	43	...
{ Bristol County. . . . . Kent County. . . . . Newport Co., Towns Newport City. . . . . Prov. Co., Towns. . . . . Providence City. . . . . Washington Co. . . . . }	3	34	6	6	.....	9	.....	4	.....	1	.....	28	.....	184	12	...	
	3	2	.....	.....	.....	1	.....	.....	.....	.....	1	1	.....	.....	...	...	
	4	18	3	5	13	19	3	1	3	3	8	9	.....	12	26	22	
	17	13	6	10	11	45	3	1	6	5	12	21	.....	20	16	30	
	4	11	3	2	3	12	1	.....	.....	.....	1	6	.....	15	7	4	
	5	11	8	10	7	22	3	10	2	.....	4	23	2	19	11	7	
	38	71	55	26	93	189	20	24	63	8	66	59	6	90	92	143	
	65	78	80	68	100	322	30	30	61	12	52	104	11	73	192	243	
	4	13	6	4	20	33	6	4	17	.....	15	9	1	44	20	19	

## COMMENTS.

In the following remarks upon the various principal causes of death in Rhode Island, during the year 1880, an alphabetical order will be followed, as presented in Table XLIX.

## DEATHS FROM ACCIDENTS.

The number of deaths from accidental causes of all kinds, reported in Rhode Island in 1880, was 137. This number is 35 more than in 1879, and 15 more than in 1878.

Of these 137 deaths, 21 were from burns and scalds; 33 by drowning; 14 from falls; 5 from poisoning; 18 from railroad accidents, and 46 from various accidents too numerous to specify.

Of the whole number of deaths by accidents, 101 were males, and 36 were females; 52 were of American, and 85 were of foreign parentage.

It will be noticed how much larger the proportion of males is than that of females; that is, 74 per cent. of male decedents to 26 per cent. of female decedents. Of parentage, 62 per cent. was of foreign, and 38 per cent. of American.

The number of deaths in each quarter of the year was as follows:

First Quarter.....	33	Second Quarter.....	37
Third Quarter.....	36	Fourth Quarter.....	33
Total.....	137		

In regard to periods of life, the decedents from accidental causes were divided as follows: Under 5 years, 28; 5 and under 10, 19; between 10 and 20, 13; between 20 and 40, 32; between 40 and 60, 28; over 60, 14; and three, age not stated.

In regard to sectional divisions of the State, 4 of the deaths from accidental causes were in Bristol county; 17 in Kent county; 9 in Newport county; 4 in Washington county, and 103 in Providence county. In Providence county, with less than 72 per cent. of the whole population of the State, there was 75 per cent. of the whole number of deaths from accidents, and in Providence city, with about 38 per cent. of the population of the State, there was about 47 per cent. of the deaths from the same causes.

The whole number of deaths from accidental causes, in 1880, *in proportion to the whole number of deaths* from specified causes, in the State, was 3 per cent.; the extremes were 5.8 per cent. in Kent county, and 1.5 per cent. in Washington county.

*In proportion to population* the accidental deaths were as follows:

Bristol County.....	One in every 2,848 of the population.
Kent County.....	One in every 1,211 of the population.
Newport County.....	One in every 2,688 of the population.
Providence County, Towns.....	One in every 2,447 of the population.
Providence City.....	One in every 1,613 of the population.
Washington County.....	One in every 5,624 of the population.
Whole State.....	One in every 2,018 of the population.



## APOPLEXY AND PARALYSIS.

The number of deaths reported in Rhode Island, in 1880, caused by Apoplexy and Paralysis, was 215.

This number is 5 less than in the preceding year, and 27 more than in 1878.

The following Table will present some of the incidental relations of these causes of death, during the last sixteen years:

TABLE L.

*Showing the whole number and percentage of the Deaths in the State, from Apoplexy and Paralysis combined; and also the Sex and Parentage of the Decedents from these causes, and the number of the same in each of the Counties, from 1865 to 1880 inclusive.*

YEARS.	Whole Number of Deaths.	APOPLEXY AND PARALYSIS.											
		Number from Apoplexy and Paralysis.	Per cent.	SEX.		PARENTAGE.		DIVISIONS OF THE STATE.					
				Males.	Females.	American.	Foreign.	Bristol County.	Kent County.	Newport County.	Providence County, Towns.	Providence City.	Washington County.
1865 . . .	3,405	100	2.93	52	48	81	19	9	8	14	23	38	8
1866.....	2,970	92	3.09	46	46	80	12	8	5	17	24	29	9
1867.....	2,889	124	4.29	59	65	101	23	9	9	13	35	49	9
1868.....	2,912	111	3.81	56	55	86	25	9	6	19	27	46	4
1869.....	3,382	117	3.46	55	62	92	25	12	13	18	20	48	6
1870 . . .	3,298	130	4.32	68	62	105	25	14	10	10	39	52	5
1871 . . .	3,344	156	4.66	73	83	113	43	10	17	15	40	61	13
1872.....	4,247	125	2.97	62	63	96	29	17	9	10	27	52	10
1873 . . .	4,403	134	3.04	59	75	109	25	9	8	17	26	57	17
1874.....	4,229	156	3.69	84	72	120	36	14	10	16	42	59	15
1875.....	4,317	166	3.61	79	87	133	33	7	13	17	46	75	8
1876.....	4,116	165	4.01	79	86	130	35	13	11	13	45	68	1
1877 . . .	4,450	181	4.07	87	94	123	58	10	10	16	52	74	19
1878.....	4,441	188	4.23	104	84	145	43	12	16	21	58	66	15
1879.....	4,472	220	4.92	114	106	146	74	12	9	29	71	89	10
1880.....	4,829	215	4.67	109	106	157	58	18	13	22	71	78	13
Total. . .	61,644	2,380	3.80	1,168	1,194	1,817	563	183	167	267	646	941	176

There was a slight falling off in number and percentage of deaths from Apoplexy in 1880, as compared with the previous year. It is none the less true, however, that the percentage of deaths from these causes, in proportion to whole number of deaths, has gradually increased, with slight fluctuations only, throughout the whole period of registration presented above. It will be seen that the proportion in 1865 was less than 3 per cent., and that in 1879 it had reached nearly 5 per cent. It can scarcely be expected that the increase will continue in the years to come, with an equal pace.

The increase in number and proportion, as will be seen in Table L., is largely in decedents of foreign parentage, in which class the increase during the last four years is something phenomenal.

TABLE LI.

*Showing the ages of Decedents from Apoplexy and Paralysis in each of the last sixteen years.*

APOPLEXY AND PARALYSIS.	PERIODS OF LIFE.							
	Under 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 and over.
1865.....		8	5	6	19	20	28	19
1866.....	1	1	7	16	9	24	27	7
1867.....	2		6	6	15	38	40	17
1868.....	2	3	3	11	16	27	31	16
1869.....	1	1	5	12	20	28	34	15
1870.....	4	1	10	9	12	38	41	20
1871.....	3	4	7	14	21	46	45	15
1872.....	1	4	5	17	20	26	41	11
1873.....	2	8	4	14	22	35	37	16
1874.....	1	2	9	9	30	39	40	25
1875.....	6	2	8	19	23	40	45	22
1876.....	4	4	4	13	25	43	40	23
1877.....	1	2	9	12	24	50	61	22
1878.....	4	2	7	14	41	40	53	26
1879.....	4	6	11	18	27	57	59	38
1880.....	1	2	8	18	21	59	70	34
Total.....	37	40	108	208	345	605	690	326

Apoplexy is not a disease to be expected in the earlier periods of life. Paralysis resulting from other causes sometimes occurs, and is occasionally fatal. Hence as the two diseases are taken together in the above Table, there is one case recorded under 20 years of age. The largest number in every year, with scarcely an exception, is between the ages of 70 and 80. Above the age of 50 years, the number of decedents from apoplexy and paralysis increases rapidly in the ratio of mortality. More than 80 per cent. of all the deaths from these causes, are of persons above 50 years of age.

#### PROPORTION TO POPULATION.

Bristol County.....	One in every 633 persons.
Kent County.....	One in every 1,583 persons.
Newport County.....	One in every 1,099 persons.
Providence County, Towns.....	One in every 1,310 persons.
Providence City.....	One in every 1,344 persons.
Washington County.....	One in every 1,730 persons.

It appears that in 1880, there were nearly three times as many deaths from apoplexy and paralysis in Bristol county, in proportion to the population, as there were in Washington county, and more than twice as many as in any other division, except Newport county.

#### BRAIN, DISEASES OF.

In Table XLIX., under the head of "Diseases of the Brain," are included all those reported as "Cerebral Meningitis," "Cerebritis," "Congestion," "Inflammation," and "Diseases of the Brain."

The number of decedents from these several causes, grouped under the head of "Diseases of the Brain," in 1878, was 139; in 1879 was 157; and in 1880 was 161. The proportion to whole mortality in the State, was 3.72 per cent. in 1879, and 3.49 per cent. in 1880. Of the 161 decedents, 87 were males, and 74 were females. In regard to parentage, 87 were of American, and 74 of foreign parentage.

The deaths in the different seasons of the year were as follows:

First Quarter.....	47	Second Quarter.....	41
Third Quarter.....	38	Fourth Quarter.....	35
Total.....	161		

In relation to the periods of life, 96 of the deaths were of children under 5 years of age, or nearly 60.0 per cent. of the whole number.

#### CANCER.

Cancer was reported as the cause of 125 deaths in 1880. The term "Cancer" includes all the different varieties.

The number of decedents from this cause, in 1880, was the same as in 1879.

The percentage of whole number of deaths in 1880, was 2.72, as against 2.96 in 1879. The difference in the percentage is occasioned by the larger number of deaths from other causes in 1880.

The varieties of cancer as reported, may be found in Tables VIII. and IX., on pages 16 and 21. They were classed as follows: Cancer in various general localities, or cancer (various), 78; cancer of the breast, 8; of the stomach, 18; of the uterus, 21.

In 1880, the deaths from cancer, in the several seasons of the year, were as follows:

First Quarter.....	21	Second Quarter.....	33
Third Quarter.....	33	Fourth Quarter.....	38
Total.....		125	

#### CHILD—BIRTH.

Cases of death are reported as having been caused by child-birth, without stating whether from hemorrhage, convulsions, nervous shock, local injury or what. As child-birth was the primary cause, the immediate cause is not so important. Under the head of "Child-birth," therefore, are included puerperal fever, puerperal convulsions, and whatever causes that can only occur as the result of child-birth.

The number reported in 1880, was 51; 33 of which were from the immediate effects of child-birth, without specifying particular cause, 3 from puerpural convulsions, and 15 from puerpural fever.

Of the 33 decedents from the immediate effects of child-birth, 15 were of American, and 18 were of foreign parentage; of the 3 from puerpural convulsions, 2 were of American, and 1 of foreign parentage; of the 15 from puerpural fever, 6 were of American, and 9 of foreign parentage.

Of the whole number, 23 were of American, and 28 of foreign parentage.

In the different seasons of the year they occurred as follows:

First Quarter.....	20	Second Quarter.....	8
Third Quarter.....	5	Fourth Quarter.....	18

Of the decedents, 20 were under 20 years of age, 27 between 20 and 30, 18 between 30 and 40, and the remaining 4 over 40 years of age.

#### CHOLERA INFANTUM.

The number of deaths reported as caused by cholera infantum, in 1880, was 247.

This number is very much larger than that of the two previous years, as may be seen by reference to Table LII.

This disease had been gradually growing less, diminishing from 391 in 1872, to 161 in 1879. It is quite probable that the number in 1879 will be the minimum of a long series of years following 1870.

Of the 247 decedents, 123 were males and 124 females; 109 were of American, and 138 of foreign parentage; 180 were under the age of one year, and 67 were between 1 and 2 years of age.

In regard to season, two deaths were reported in February, four in April, five in May, 16 in June, 198, or about 80.0 per cent., in the months of July, August and September, and 22 during the rest of the year.

The following Table shows the whole number of reported deaths from cholera infantum; the sex and parentage of the decedents, in each of the larger divisions of the State, in each of the last sixteen years:

TABLE LII.

YEARS.	Number of Deaths.	CHOLERA INFANTUM.									
		SEX.		PARENTAGE.		DIVISIONS OF THE STATE.					
		Males.	Females.	American.	Foreign.	Bristol County.	Kent County.	Newport County.	Providence County, Towns.	Providence City.	Washington County.
1865.....	145	63	82	61	84	17	7	14	48	50	9
1866.....	110	67	43	50	60	1	7	8	39	47	8
1867.....	117	64	53	63	55	4	8	7	45	49	9
1868.....	154	85	69	66	88	13	4	12	44	70	11
1869.....	151	81	70	79	72	6	15	6	48	65	11
1870.....	213	106	107	95	118	15	15	13	69	98	8
1871.....	172	85	87	82	90	14	12	12	59	62	13
1872.....	391	195	196	167	224	16	16	21	157	151	30
1873.....	285	148	137	165	120	17	14	16	120	99	19
1874.....	265	140	125	115	150	4	12	5	84	134	26
1875.....	318	156	162	155	163	20	16	20	108	136	18
1876.....	250	131	119	105	145	5	12	29	68	134	12
1877.....	259	139	120	96	163	12	13	9	96	122	7
1878.....	168	96	72	73	95	7	14	7	64	71	5
1879.....	161	88	73	71	90	8	16	21	51	59	6
1880.....	247	123	124	109	138	13	11	10	93	100	20
Total, 16 years.....	3,406	1,767	1,639	1,551	1,855	173	187	210	1,193	1,422	212

It will be seen that during the last sixteen years, 3,406 children have died from cholera infantum, of which 1,767 were males, and 1,639 were females.

Of American parentage there were 1,551, and of foreign parentage 1,855, or about 120 foreign to each 100 of American parentage.

#### CONSUMPTION.

The number of decedents during 1880, in Rhode Island, reported as having died from consumption, was 642.

This number is less than during any year since 1874, with the exception of 1879.

The proportion to the whole number of deaths, 14.02 per cent., is not only less than that of 1879, because of the larger whole number of deaths in 1880, but also less than in any year during the whole period of registration.

The average of twenty years, from 1860 to 1879 inclusive, was 16.84 per cent.

Of these 642 decedents, 287 were males, and 355 were females.

In regard to parentage, 287 were of American, and 355 were of foreign parentage.

The proportions of the sexes are 44.7 males, and 55.3 females in each one hundred, or 123.7 females to each 100 males.

The proportions in regard to parentage are 44.7 males, and 55.3 females in each one hundred, singularly coinciding in proportion with the sexes, in the order named.

There were 123.7 of foreign parentage to each 100 of American.

In regard to season, the largest number of deaths occurred in the first quarterly division of the year, and the smallest number in the second, as will be seen by the following summary:

First Quarter. ....	166	Second Quarter. ....	146
Third Quarter.....	166	Fourth Quarter....	162
Total.....	642		

The largest mortality in any one month was in March, the next largest in April, and the smallest in June.

The month of May has shown the largest number of deaths from consumption, with a very few exceptions, during the whole twenty-eight years of registration. In 1880, this month reported only 44, the next to the smallest monthly number in the year.

In relation to age, consumption spares no period of life, but the largest number of decedents are found between the ages of twenty and forty.

In 1880, 334, or more than 50 per cent. of the whole number of deaths from consumption, were of persons between twenty and forty years of age. In order to show more concisely the relation of age to mortality, the following synopsis is presented:

Ages.	No. of Deaths.
Under 10 years of age.....	33
Between 10 and 20 years.....	58
Between 20 and 30 years.....	199
Between 30 and 40 years.....	135
Between 40 and 50 years.....	82
Between 50 and 70 years.....	105
Over 70 years.....	30
<hr/>	
Total.....	642

The distribution of mortality from consumption, in the different sections of the State, is very unequal, not only in the percentage to the whole number of deaths in each section, but also in proportion to the population.

The following Table shows the total deaths from all reported *known causes*, with the number and percentage of deaths from consumption, in each of the larger divisions of the State, and in the whole State, in each of the last fifteen years, and in the aggregate for a period of twenty years, from 1860 to 1879 inclusive:

TABLE LIII.—CONSUMPTION.—*Number and Percentage.*

COUNTIES.	1866.	1867.	1868.	1869.	1870.	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	Total 20 years. 1860-1879.
<b>BRISTOL COUNTY.</b>																
Total Deaths.....	163	144	129	165	146	150	184	173	159	162	148	201	187	141	209	3,144
Consumption.....	31	18	21	26	26	16	23	16	18	21	19	27	23	16	19	423
Percentage.....	19.13	12.50	16.28	15.76	17.81	10.67	12.50	9.24	11.32	12.97	12.83	13.43	12.30	11.35	9.09	18.45
<b>KENT COUNTY.</b>																
Total Deaths.....	198	214	168	265	238	281	248	241	252	263	209	251	249	277	293	4,761
Consumption.....	41	56	38	50	46	63	33	42	32	43	28	42	41	38	45	870
Percentage.....	20.70	26.17	22.62	18.86	19.33	22.42	13.30	17.43	12.69	16.35	13.39	16.73	16.47	13.72	15.35	18.28
<b>NEWPORT COUNTY.</b>																
Total Deaths.....	342	302	289	259	271	214	262	306	231	277	280	243	265	330	324	6,017
Consumption.....	52	47	43	40	37	23	29	44	26	41	45	33	31	45	34	857
Percentage.....	15.18	15.56	14.88	15.44	13.66	10.75	11.06	12.02	11.77	14.80	16.07	13.58	11.69	13.64	10.49	14.24
<b>PROVIDENCE COUNTY, TOWNS.</b>																
Total Deaths.....	863	902	779	912	964	989	1,331	1,389	1,217	1,230	1,110	1,391	1,308	1,233	1,437	20,385
Consumption.....	171	210	158	180	172	195	221	197	139	201	211	222	229	197	189	3,661
Percentage.....	19.36	23.28	20.29	19.74	17.84	19.72	16.73	14.18	11.42	16.34	19.01	15.96	17.51	15.98	15.35	17.95



TABLE LIII.—CONSUMPTION.—Number and Percentage.—Continued.

COUNTIES.	1866.	1867.	1868.	1869.	1870.	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	Total 20 years. 1860-1879.
<b>PROVIDENCE CITY.</b>																
Total Deaths.....	1,013	945	1,086	1,240	1,249	1,239	1,581	1,725	1,965	1,894	1,850	1,932	1,973	2,017	2,063	28,194
Consumption.....	200	189	214	210	238	195	242	230	270	297	284	294	305	293	322	4,649
Percentage.....	19.74	20.00	19.71	16.95	19.06	15.74	15.31	13.33	13.74	15.68	15.35	15.22	15.46	14.53	15.60	16.49
<b>WASHINGTON COUNTY.</b>																
Total Deaths.....	201	187	173	241	233	222	265	292	263	294	306	240	249	230	270	4,513
Consumption.....	28	39	38	43	56	35	49	51	44	47	68	43	47	48	33	861
Percentage ..	13.93	20.86	21.96	17.84	24.04	15.76	18.49	17.47	16.73	16.55	22.22	17.91	18.88	21.82	12.22	19.08
<b>WHOLE STATE.</b>																
Total Deaths.....	2,799	2,694	2,624	3,062	3,101	3,095	3,871	4,186	4,077	4,110	3,903	4,258	4,281	4,218	4,596	67,214
Consumption.....	523	559	512	549	575	527	597	580	529	650	655	661	676	637	642	11,321
Percentage.....	18.68	20.74	19.51	17.81	18.52	17.03	15.41	13.86	12.96	15.79	16.78	15.52	15.98	15.10	14.02	16.84

The statistics of consumption presented in Table LIII., in regard to the number and percentage of decedents, in connection with locality, will enable the reader to make ready and conclusive comparisons.

It was remarked in a previous report that by arranging in parallel columns the items of single years, and combining together a long series of years, the results of single years can be readily compared, and the averages of a long period conclusively ascertained.

The variations of one year with another in the same locality, and of different localities in the same year, and the averages for a considerable number of years, are shown in such manner as to allow very definite conclusions.

In Bristol county, the annual percentages of mortality from consumption, to total deaths in the same county, have varied from 9.09 per cent. in 1880, to 19.13 per cent. in 1876.

The percentage of 1880, 9.09, is less than in any previous year. The average of twenty years is 13.45 per cent., and is the smallest of any county.

Kent county shows a variation of from 12.69 per cent. in 1874, to 26.17 per cent. in 1867. In 1879 the percentage was 13.72, scarcely above half that of 1867. The mean average percentage of the long period is 18.28, the largest, with one exception, of any county in the State.

Following close upon the low average percentage of the twenty year period in Bristol county, we find Newport county with a mean of 14.24 per cent., or about four-fifths of one per cent. larger.

The variations in the annual percentages of Newport county, as seen in the foregoing Table, are from 10.75 per cent. in 1871, to 16.07 per cent. in 1876. The percentage of 1880 is 10.49, the smallest on record.

Providence county towns show variations from 11.42 per cent. in 1874, to 23.28 per cent. in 1867, as may be seen in the Table. In 1862, there was in the towns of Providence county the high rate of 24.78 per cent., the largest on record for that county. In the same year the percentage of the whole State was 21.22, also the largest on record.

The percentage of consumption to total given causes of mortality in Providence county towns, in 1880, was 15.35; for twenty years, 1860 to 1879 inclusive, the average was 17.95 per cent.; or about two and two-thirds per cent. higher than the rate of 1880.

In Providence city, the proportion of deaths from consumption to total specified deaths, was 15.60 per cent.

Washington county has almost invariably shown a large percentage of mortality from consumption. The average percentage for the term

of twenty years, is larger than any other section of the State. The smallest percentage during the last sixteen years was recorded in 1880, that is, 12.22; the largest in 1870, which was 24.04 per cent.

The average mortality of twenty years is 19.08 per cent.; and of 1879, 21.82 per cent., or more than 9.5 per cent. larger than in 1880.

The smaller proportional number of deaths from other diseases, makes the percentage of deaths from consumption larger. For instance, in 1879, the proportion of deaths from all diseases to population, in Washington county, was 11.1 in each one thousand; in Providence county, 17.2 in each thousand.

The variation of the extremes of proportion in the whole State, during the last fifteen years, is from 20.74 per cent. in 1867, to 12.96 per cent. in 1874.

The percentage of 1880 is, as before stated, 14.02, and the annual average of twenty years 16.84 per cent.

#### PROPORTION OF DEATHS TO POPULATION.

For the purpose of ascertaining and presenting the percentage of deaths from consumption, *in proportion* to the *population*, in the different divisions of the State, the following summary was prepared. It will show the yearly average number of deaths from this cause, and the proportion to population in each division, for a period of nineteen years; namely, from 1860 to 1879. If the population of all sections increased with equal ratio, such comparison would show the relative liability of the inhabitants of each section to the disease, with quite full accuracy. But as it is, an average of the semi-decennial enumerations will afford such an approximation to exactness, as to make the comparisons sufficiently correct.

1860 to 1879.

#### NINETEEN YEARS.

	Yearly average. No. of Deaths.	Yearly average to population one in every	
Bristol County.....	21.4.....	443.....	or 2.96 in each 1,000
Kent County.....	43.8.....	403.....	or 2.48 in each 1,000
Newport County.....	42.7.....	422.....	or 2.09 in each 1,000
Providence County, Towns.....	183.3.....	403.....	or 2.48 in each 1,000
Providence City.....	239.0.....	349.....	or 2.97 in each 1,000
Washington County.....	48.0.....	452.....	or 2.21 in each 1,000

For the purpose of comparison with the long period of nineteen years, as well as each with the other, the following summary for the two years 1879 and 1880 is presented:

#### CONSUMPTION, PROPORTION OF DEATHS TO POPULATION.

##### 1879.

	Total Deaths.	To population one in every	
Bristol County.....	16.....	712.....	or 1.40 in each 1,000
Kent County.....	38.....	542.....	or 1.84 in each 1,000
Newport County.....	45.....	538.....	or 1.86 in each 1,000
Providence County, Towns.....	197.....	473.....	or 2.11 in each 1,000
Providence City.....	293.....	358.....	or 2.80 in each 1,000
Washington County.....	48.....	470.....	or 2.13 in each 1,000

##### 1880.

	Total Deaths.	To population one in every	
Bristol County.....	19.....	599.....	or 1.66 in each 1,000
Kent County.....	45.....	458.....	or 2.18 in each 1,000
Newport County.....	34.....	711.....	or 1.40 in each 1,000
Providence County, Towns.....	189.....	496.....	or 2.08 in each 1,000
Providence City.....	323.....	336.....	or 3.07 in each 1,000
Washington County.....	33.....	681.....	or 1.50 in each 1,000

The proportions of 1879 and 1880 are based on the Census of 1880.

It would appear by a comparison of the last two years, with the long period of nineteen years, that the proportion of deaths from consumption to population, was diminishing in all parts of the State outside of Providence city. The results of one or two years, however, are very inconclusive in regard to proportion, as very considerable changes in numbers not infrequently occur, from one year to another.

#### CROUP AND DIPHTHERIA.

These two diseases, similar in many respects, have been considered together in these reports since 1858. The contrast is made for the purpose of showing their various relations, the same as with other diseases, and not from any suspicion of identity, croup being primarily, by general belief, a local disease, and diphtheria a constitutional disease.

The following Table shows the number of deaths and the sex of the decedents in Rhode Island, from croup and from diphtheria, in each of the seven years, from 1858 to 1864 inclusive:

TABLE LIV.

YEARS.	CROUP.			DIPHTHERIA.		
	Males.	Females.	Total.	Males.	Females.	Total.
1858.....	35	34	69	1	5	6
1859.....	37	21	58	10	10	20
1860.....	27	30	57	24	43	67
1861.....	32	26	58	66	74	140
1862.....	34	39	73	31	50	81
1863.....	51	46	97	73	82	155
1864.....	48	57	105	67	93	160
Seven Years.....	264	253	517	272	367	639

Table LIV. has been continued from previous reports for the reason that comparisons of deaths and sex of decedents may be made, from year to year, from the first appearance of diphtheria in the State. It could not well be combined with Table LV., because the parentage of decedents prior to 1865 had not been presented in these Reports.

The aggregate number of decedents from diphtheria during the first five years of its prevalence in the State, were exactly the same as the total decedents from croup during the same period. During the succeeding two years, diphtheria had exceeded croup about fifty per cent.

The following Table gives the number, the sex and the *parentage* of the decedents from croup and from diphtheria, in Rhode Island, in each of the last sixteen years, from 1865 to 1880 inclusive:

TABLE LV.

YEARS.	CROUP.					DIPHTHERIA.				
	Number of Deaths.	SEX.		PARENTAGE.		Number of Deaths.	SEX.		PARENTAGE.	
		Males.	Females.	American.	Foreign.		Males.	Females.	American.	Foreign.
1865.....	94	44	50	82	62	82	41	41	62	20
1866.....	53	26	27	22	31	64	26	38	36	28
1867.....	50	25	25	21	29	31	14	17	19	12
1868.....	30	13	17	14	16	20	8	12	11	9
1869.....	41	10	22	14	27	33	18	15	19	14
1870.....	53	29	24	25	28	33	17	16	18	15
1871.....	72	39	33	31	41	57	23	34	29	28
1872.....	66	37	29	17	49	48	24	24	35	13
1873.....	68	30	38	35	33	45	24	21	35	10
1874.....	65	29	26	38	27	59	30	29	37	22
1875.....	96	53	43	43	53	33	17	16	18	15
1876.....	102	50	52	42	60	159	77	82	69	90
1877.....	95	48	47	34	61	492	239	253	233	259
1878.....	93	45	48	43	50	435	234	211	201	234
1879.....	96	56	38	40	56	259	121	138	143	116
1880.....	66	32	34	27	39	152	73	79	75	77
Total, 16 years.....	1,140	587	553	478	662	2,002	976	1,026	1,040	962

The remarkable difference in the number of decedents one year with another, between croup and diphtheria, will hardly fail to be noticed. During the last 16 years, the largest number of deaths in any year from croup, was 102, in 1876, and the smallest number was 30, in 1868.

During the same time, the variation in the number of deaths from diphtheria, was from 20, in 1868, to 492, in 1877.

Diphtheria has declined largely in number of decedents since 1878, numbering only 152 in 1880.

#### SEX AND PARENTAGE.

During the twenty-three years, 1858 to 1880 inclusive, of the whole number of decedents from croup, 851 were males, and 806 were females; or 105.5 males to each 100 females.

Of the whole number of decedents from diphtheria during the the same period of time, 1,248 were males; and 1,383 were females; or 90.2 males to each 100 females.

The preponderance of males in the decedents from croup, and the preponderance of females in the decedents from diphtheria, will not fail to be observed.

In regard to parentage, it will be seen that the mortality from croup is the largest in that of foreign, and the mortality from diphtheria the largest in that of American parentage.

#### SEASON AND MORTALITY.

The influence of season in regard to mortality from croup and diphtheria, may be seen in the following Table, where these diseases may also be compared with scarlatina, to which they bear resemblance in some respects. The Table will give the whole number of deaths during the periods named, and the average monthly and quarterly percentages of deaths, from each disease:

TABLE LVI.

MONTHS.	CROUP. 1858-1879.		DIPHTHERIA. 1858-1879.		SCARLATINA. 1858-1879.	
	Number of Deaths.	Per cent.	Number of Deaths.	Per cent.	Number of Deaths.	Per cent.
January.....	237	12.43	238	9.35	491	11.63
February.....	204	10.70	171	6.63	453	10.73
March.....	165	8.65	194	7.54	418	9.90
First Quarter.....	606	31.78	603	23.42	1,363	32.26
April.....	135	7.07	145	5.64	360	8.39
May.....	94	4.91	102	6.30	283	9.04
June.....	91	4.80	165	6.40	346	8.19
Second Quarter.....	320	16.78	472	18.34	1,078	25.52
July.....	80	3.14	129	5.01	247	5.85
August.....	54	2.88	154	6.00	199	4.71
September.....	123	6.47	235	9.14	199	4.71
Third Quarter.....	237	12.44	518	20.15	645	15.27
October.....	208	10.64	342	13.34	274	6.50
November.....	261	13.68	334	12.99	366	8.66
December.....	280	14.68	302	11.76	496	11.77
Fourth Quarter.....	744	39.00	978	38.09	1,336	26.36
Totals.....	1,907	100.00	2,571	100.00	4,221	100.00

An examination of the preceding Table will show, that *season* has a very decided and unmistakable influence upon the production of mortality from the three named diseases, if not upon the prevalence of the same.

More extended comments and observations in relation to the influence of season, and the variableness of the influence in the production of mortality from the three different diseases, may be found in the preceding Registration Report (the twenty-seventh).

The following Table will show the statistics of scarlatina for each of the last twenty-six years, from 1855 to 1880 inclusive, the whole number of deaths in the State; the number, and percentage and sex of the decedents from scarlatina, and the number from scarlatina in each division of the State. It also shows, from 1865 to 1880 inclusive, the parentage of the decedents from scarlatina:



TABLE LVII.

YEARS.	Whole Number of Deaths.	SCARLATINA.											
		Scarlatina.	Per cent.	SEX.		PARENTAGE.		DIVISIONS OF THE STATE.					
				Males.	Females.	American.	Foreign.	Bristol County.	Kent County.	Newport County.	Providence County, Towns.	Providence City.	Washington County.
1855.....	1,846	71	3.8	41	30			25		1	6	43	
1856.....	2,042	208	10.2	109	99			3	1	3	57	144	
1857.....	2,325	147	6.3	69	78				20	47	47	33	1
1858.....	2,616	234	8.9	118	116			5	11	75	61	73	10
1859.....	2,270	71	3.1	34	37			5	2	4	14	45	1
1860.....	2,686	64	2.4	31	33			4	3	7	17	17	16
1861.....	2,927	57	1.9	24	33			2	2	7	9	28	9
1862.....	2,591	47	1.8	25	22			3	4	3	19	14	4
1863.....	3,207	91	2.8	40	51			1		23	24	33	10
1864.....	3,360	266	8.0	120	146			1	19	19	60	141	6
1865.....	3,405	255	7.5	130	125	134	121	33	17	3	66	106	8
1866.....	2,970	28	0.9	15	13	12	16	5		8	12	3	
1867.....	2,889	14	0.5	6	8	10	4	1		1	2	10	
1868.....	2,912	93	3.2	47	46	32	61	2	3	3	34	50	1
1869.....	3,382	286	8.4	126	160	128	158	17	23	12	72	138	24
1870.....	3,238	75	2.3	37	38	28	47	1	6	3	22	35	8
1871.....	3,344	66	1.9	41	25	31	35	1	3	1	37	21	13
1872.....	4,347	53	1.2	22	31	22	31		1	4	27	19	2
1873.....	4,403	287	6.5	124	163	163	124	4	2	42	60	132	27
1874.....	4,229	463	10.9	231	231	176	286	27	17	1	133	268	16
1875.....	4,317	185	4.3	85	100	121	64	8	30	3	35	94	15
1876.....	4,116	80	1.9	34	46	42	38	3	2	7	21	35	12
1877.....	4,450	62	1.4	26	36	29	33	14	4	3	21	12	8
1878.....	4,441	86	1.9	41	45	35	51	3	5	3	14	57	4
1879.....	4,472	311	7.4	164	147	130	181	3	6	4	37	255	6
1880.....	4,829	468	10.0	215	253	216	252	22	30	11	143	243	19
Totals, 26 Years..	87,514	4,067	4.6	1,955	2,112	1,309	1,502	190	211	296	1,100	2,048	220

## DISEASES OF THE HEART.

The number of deaths reported in Rhode Island, in 1880, from diseases of the heart, was 231. It is the largest number ever reported in

Rhode Island from this cause, and was the fifth most fatal disease in the order of largest number during 1880.

The following Table shows, for each of the last sixteen years, 1865 to 1880 inclusive, the whole number of deaths in the State; the number and percentage, and the sex and parentage of the decedents from diseases of the heart, and the number of the same in each division of the State:

TABLE LVIII.

YEARS.	Whole Number of Deaths.	DISEASES OF THE HEART.											
		Diseases of the Heart.	Per cent.	SEX.		PARENTAGE.		DIVISIONS OF THE STATE.					
				Males.	Females.	American.	Foreign.	Bristol County.	Kent County.	Newport County.	Providence County, Towns.	Providence City.	Washington County.
1865 . . .	3,405	96	2.86	51	47	65	33	6	5	8	37	47	5
1866 . . . . .	2,970	115	3.87	58	57	90	25	7	8	10	41	40	9
1867 . . . . .	2,899	114	3.94	67	47	81	33	4	9	7	37	49	8
1868 . . . . .	2,912	116	3.96	58	58	79	37	5	8	12	35	52	4
1869 . . . . .	3,389	128	3.78	75	53	79	49	2	13	11	36	63	4
1870 . . . . .	3,238	117	3.61	77	40	77	40	4	10	8	35	59	1
1871 . . . . .	3,344	144	4.30	78	66	91	53	4	7	8	43	77	6
1872 . . . . .	4,247	189	4.45	104	85	119	70	5	9	10	59	98	13
1873 . . . . .	4,403	189	4.29	88	106	122	67	4	11	14	48	101	11
1874 . . . . .	4,229	214	5.06	109	105	150	64	6	6	28	50	106	18
1875 . . . . .	4,317	186	4.31	84	102	113	73	2	13	23	49	88	12
1876 . . . . .	4,116	166	4.03	86	80	109	57	9	11	10	38	86	12
1877 . . . . .	4,450	182	4.09	94	88	110	72	3	7	9	57	93	13
1878 . . . . .	4,441	166	3.73	88	78	109	57	5	11	15	38	83	14
1879 . . . . .	4,472	202	4.73	114	88	127	75	8	20	16	38	111	9
1880 . . . . .	4,339	231	5.03	125	106	146	85	9	21	29	59	104	9
Totals, 16 years . . .	61,044	2,557	4.15	1,351	1,206	1,667	890	83	169	207	689	1,351	148

The difference in the percentage of males and females, and also of American and foreign parentage, of the decedents from diseases of the heart is quite noteworthy.

Of the 2,557 persons deceased from diseases of the heart, in the last sixteen years, 1,351 were males, and 1,206 were females; or 52.83 males and 47.17 females in each 100; or 112.0 males to each 100 females.

The difference in parentage is much more noticeable than that of sex.

Of the 2,557 decedents from disease of the heart, there were 1,667 of American parentage, and 890 of foreign parentage.

The proportions would therefore stand as follows:

To every 100 of foreign parentage there were about 190 of American; or 65.2 American, and 34.8 of foreign parentage in each 100 deaths.

The following Table shows the number of decedents from diseases of the heart, in each divisional period of life, in each of the last sixteen years:

TABLE LIX.

YEARS.	Under 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 and over.	Not stated.
1865.....	14	4	6	7	22	17	19	9	.....
1866.....	18	8	14	17	10	23	21	4	.....
1867.....	11	11	10	13	22	16	27	4	.....
1868.....	15	5	13	11	14	26	25	5	.....
1869.....	21	4	14	18	20	22	21	7	1
1870.....	19	6	11	13	20	21	23	3	1
1871.....	9	12	10	19	23	26	28	6	1
1872.....	27	12	22	19	31	36	29	13	.....
1873.....	19	11	26	18	25	35	42	9	2
1874.....	20	16	26	21	27	50	40	12	2
1875.....	14	16	25	20	32	29	41	9	.....
1876.....	14	10	15	19	20	38	39	10	1
1877.....	15	11	20	18	27	45	33	13	.....
1878.....	16	8	18	16	26	36	35	11	.....
1879.....	19	9	13	25	23	51	36	16	.....
1880.....	15	10	18	23	38	49	49	28	1
Totals, 16 years.....	266	153	263	277	390	533	506	159	9

The results of sixteen years registration, with record of ages of decedents from diseases of the heart, show in periods of twenty years of life, the following percentages:

Under 20 years of age .....	10.4 per cent.
Between 20 and 40.....	16.3 per cent.
Between 40 and 60.....	26.2 per cent.
Between 60 and 80.....	40.6 per cent.
Over 80.....	6.2 per cent.
Not stated.....	0.3 per cent.

It will be seen that nearly one half of all the deaths from diseases of the heart, were of persons over sixty years of age.

#### PNEUMONIA AND CONGESTION OF THE LUNGS.

The following Table shows, for each of the last sixteen years, the whole number of deaths reported in Rhode Island; the number and the percentage, with the sex and the parentage of the decedents from pneumonia and congestion of the lungs, and the number in each year, in each division of the State:

TABLE LX.

YEARS.	Whole Number of Deaths.	PNEUMONIA AND CONGESTION OF THE LUNGS.											
		Pneumonia, &c.	Per cent.	SEX.		PARENTAGE.		DIVISIONS OF THE STATE.					
				Males.	Females.	American.	Foreign.	Bristol County.	Kent County.	Newport County.	Providence County, Towns.	Providence City.	Washington County.
1865 .....	3,406	175	5.1	80	95	110	65	8	11	21	49	74	12
1866 .....	2,970	193	6.5	94	99	127	66	13	17	13	59	81	10
1867 .....	2,899	172	5.9	68	104	103	69	8	12	12	56	68	16
1868 .....	2,912	191	6.6	99	92	120	71	9	5	16	54	92	15
1869 .....	3,332	190	5.6	104	86	110	80	7	10	10	63	88	12
1870 .....	3,228	182	5.6	102	80	96	86	6	12	15	55	78	16
1871 .....	3,344	218	6.5	104	114	129	89	12	21	11	68	85	21
1872 .....	4,247	229	5.4	119	110	125	104	11	1	9	74	120	14
1873 .....	4,402	284	5.3	127	107	143	91	11	9	10	65	123	16
1874 .....	4,229	260	5.9	118	122	143	107	6	13	7	73	126	15
1875 .....	4,317	400	9.3	199	201	242	157	14	27	25	106	198	31
1876 .....	4,116	339	8.2	164	175	162	177	13	22	16	97	163	27
1877 .....	4,450	296	5.1	104	122	127	99	10	7	14	81	98	16
1878 .....	4,441	317	7.1	143	174	176	141	10	11	18	110	140	28
1879 .....	4,472	311	7.4	148	163	163	148	7	15	15	108	156	15
1880 .....	4,829	364	7.9	180	184	177	187	26	16	18	92	192	20
Totals, 16 years..	61,644	3,991	6.5	1,953	2,038	2,254	1,737	171	210	230	1,204	1,892	284

The number of decedents from pneumonia and congestion of the lungs, during 1880, was larger than in any previous year, with the exception of 1875. The proportion of the sexes was nearly equal, and the difference in the parentage was considerably less than the average.

The number of decedents in Bristol county was nearly double that of any previous year, and nearly four times as many as in 1879. There was an increase of 20 per cent. over the previous year in Newport county; about 23 per cent. in Providence city; and 33 per cent. in Washington county.

The following Table shows, for each of the last sixteen years, the number of decedents in Rhode Island from pneumonia and congestion of the lungs, in each of the several periods of life:

TABLE LXI.

YEARS.	Under 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 and over.	Not stated.
1865.....	65	4	2	....	14	11	15	17	21	21	5	....
1866.....	57	4	4	5	12	10	14	21	25	32	9	....
1867.....	57	9	2	3	10	11	13	16	25	13	12	1
1868.....	70	4	3	3	15	8	16	13	19	27	13	....
1869.....	64	11	1	2	11	12	9	28	25	16	11	....
1870.....	84	6	5	4	6	7	8	14	20	19	8	1
1871.....	71	7	2	7	10	17	16	16	35	17	19	1
1872.....	83	5	1	7	17	20	19	22	24	19	11	1
1873.....	105	4	8	3	10	14	16	17	24	23	10	....
1874.....	76	9	4	6	17	17	25	21	40	27	8	....
1875.....	120	9	3	8	22	30	35	39	61	43	28	2
1876.....	116	5	4	3	20	20	32	35	48	39	17	....
1877.....	79	2	....	7	15	15	24	27	22	24	9	2
1878.....	115	9	4	10	14	17	28	20	42	45	13	....
1879.....	102	8	1	3	14	27	26	35	38	38	19	....
1880.....	95	18	3	16	14	33	37	46	47	43	12	....
Total.....	1359	114	47	87	221	269	333	387	516	446	204	8

The very great increase of mortality from pneumonia, in persons from five to ten years of age, is quite remarkable. The average of

fifteen years previous to 1880, was 6.4 decedents from five to ten years of age. It will be seen that the number in 1880, that is, 18, is nearly three times the average of the preceding years.

The same remarks will apply equally well to the period of life between fifteen and twenty, in which the proportionate increase of mortality is even greater.

#### TYPHOID FEVER.

The number of deaths in Rhode Island, in 1880, reported under the general title of "Fevers," was 158. This number is 44 more than in 1879, and 8 more than in 1878. The number includes all reported under the following specific terms: "Bilious," 4; "Remittent," 3; "Typhoid or Typhus," 137; "Yellow Fever," 1; "Fever," 13. It is probable that *nearly* all fevers occurring in Rhode Island are essentially typhoid, the type being modified by a variety of circumstances. Of course the term is not designed to cover all febrile states, dependent on malaria or a variety of acute and chronic inflammations.

The following Table shows, for each of the last sixteen years, the whole number of deaths in the State; the number and the percentage, and the sex and parentage of the decedents from fevers, and the number in each division of the State:

TABLE LXII.

YEARS.	Whole Number of Deaths.	TYPHOID FEVER.											
		Typhoid Fever.	Per cent.	SEX.		PARENTAGE.		DIVISIONS OF THE STATE.					
				Males.	Females.	American.	Foreign.	Bristol County.	Kent County.	Newport County.	Providence County, Towns.	Providence City.	Washington County.
1865.....	3,405	229	6.4	114	115	149	80	8	17	22	82	79	21
1866.....	2,970	150	5.0	73	77	82	68	7	5	32	54	45	7
1867.....	2,899	119	4.1	60	59	84	35	9	10	17	47	31	5
1868.....	2,912	84	2.9	45	39	57	27	4	5	7	30	23	15
1869.....	3,382	101	3.0	53	48	79	22	7	7	1	37	33	16
1870.....	3,228	153	4.7	66	87	80	73	5	11	14	57	49	17
1871.....	3,344	125	3.7	60	65	69	56	2	8	10	41	51	13
1872.....	4,247	179	4.2	87	92	91	88	4	12	6	75	65	17
1873.....	4,408	172	3.9	73	99	113	59	4	9	9	61	56	23
1874.....	4,229	117	2.8	57	60	56	61	1	10	3	37	58	8
1875.....	4,317	147	3.4	73	74	90	57	1	4	6	49	69	18
1876.....	4,116	126	3.0	65	61	71	55	5	9	13	44	33	22
1877.....	4,450	134	3.0	63	71	65	69	8	10	8	52	44	12
1878.....	4,441	150	3.4	68	82	77	73	13	15	7	62	56	14
1879.....	4,472	114	2.7	47	67	63	51	4	12	6	44	40	7
1880.....	4,829	158	3.4	74	84	94	64	8	12	5	66	52	15
Totals, 16 years..	61,644	2,258	3.6	1,078	1,180	1,320	938	90	157	166	838	786	240

It will be seen that the number of decedents from "Fever," in 1880, was not only larger than in 1879, but the percentage of mortality from that cause, to all named causes of death, was also considerably larger.

## SEX.

The difference in regard to sex was less than in the previous year, 113.5 females to each 100 males in 1880; as against 142.5 females to each 100 males in 1879. The average of the last sixteen years is about 109 females to each 100 males; or 52.2 females and 47.8 males in each 100 decedents.

## PARENTAGE.

In relation to parentage the difference in number was quite unusual.

Of the decedents from "Fever," in 1880, there were 94 of American parentage, and 64 of foreign; or 146.8 of American to each 100 of foreign; or 59.5 of American and 40.5 of foreign parentage in each 100 decedents.

The following Table shows the number of decedents from fevers, in each division of ages, in each of the last sixteen years, in the State of Rhode Island:

TABLE LXIII.

TYPHOID FEVER.		PERIODS OF LIFE.																
YEARS.		Under 10.	10 to 15.	15 to 20.	20 to 25.	25 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 and over.	Not stated.					
1865	.....	35	18	46	54	30	14	18	7	5	2	...	...	...	...	...	...	
1866	.....	23	10	21	26	31	16	9	14	10	...	...	...	...	...	...	...	
1867	.....	17	6	23	33	12	11	8	4	2	2	1	...	...	...	...	...	
1868	.....	10	7	10	21	8	8	10	4	5	...	...	...	...	...	...	...	
1869	.....	10	8	14	28	9	7	9	8	6	2	...	...	...	...	...	...	
1870	.....	15	13	28	39	16	20	7	7	6	1	...	...	...	...	...	...	
1871	.....	13	10	20	28	18	16	9	4	5	2	...	...	...	...	...	...	
1872	.....	17	18	34	54	20	9	12	11	3	1	...	...	...	...	...	...	
1873	.....	27	12	34	31	25	13	13	7	8	2	...	...	...	...	...	...	
1874	.....	10	14	26	32	9	5	10	3	6	2	...	...	...	...	...	...	
1875	.....	23	14	19	43	18	10	10	6	4	...	...	...	...	...	...	...	
1876	.....	21	10	15	24	14	9	6	16	6	3	2	...	...	...	...	...	
1877	.....	22	13	13	36	20	8	5	7	2	2	1	...	...	...	...	...	
1878	.....	17	16	27	47	13	11	12	2	3	2	...	...	...	...	...	...	
1879	.....	19	7	14	26	15	6	3	12	8	3	1	...	...	...	...	...	
1880	.....	25	12	24	43	23	12	10	5	3	...	...	...	...	...	...	...	
Totals	.....	304	188	368	575	271	175	151	117	82	24	6	...	...	...	...	...	

During the year 1880, there were a larger number of decedents from fever, in every period of life under sixty years, than in 1879.

This is seen in a very marked degree under the age of thirty, that is, 104 decedents in 1880 against 66 in 1879. Typhoid fever is, however, a disease which, in the average of years, affects much the largest number of persons in the middle periods of life.



## COMPARATIVE RESULTS.

The following Table shows the percentage of total mortality from several prominent causes, as reported in 1880, in the whole State, and in the several divisions of the State; and also the percentages of the same causes in the whole State, in 1878 and 1879:

TABLE LXIV.

CAUSES OF DEATH.	Bristol County.	Kent County.	Newport County, Towns.	Newport City.	Providence County, Towns.	Providence City.	Washington County.	Whole State, 1880.	Whole State, 1879.	Whole State, 1878.
Accidents (all kinds). . . . .	1.91	5.81	3.81	2.98	2.65	3.16	1.48	3.51	2.43	2.89
Apoplexy and Paralysis. . . . .	8.61	4.41	10.47	5.05	4.94	3.78	4.63	4.67	5.21	4.45
Brain, Diseases of. . . . .	1.44	2.04	2.88	3.66	3.88	3.89	3.16	3.44	3.73	3.98
Cancer. . . . .	2.98	3.40	1.90	4.54	1.80	3.30	1.49	2.73	2.96	2.82
Cholera Infantum. . . . .	6.22	3.75	2.86	3.30	6.47	4.84	7.41	5.43	3.81	3.97
Consumption. . . . .	9.09	15.46	11.43	10.06	18.15	15.62	12.22	14.02	15.09	15.98
Convulsions and Fits. . . . .	1.92	4.48		4.12	3.77	2.36	1.49	2.88	2.47	2.65
Croup. . . . .	1.44	1.02	.96	1.37	1.39	1.45	2.31	1.45	2.23	2.30
Debility. . . . .	4.80	1.68	1.90	3.73	5.88	1.31	2.59	3.09	2.85	1.91
Diarrhoea. . . . .	.48	.34		4.56	1.67	1.45	1.48	1.52	1.96	1.25
Diphtheria. . . . .	1.44	2.06		.91	1.38	2.94	6.30	3.40	6.14	10.28
Dysentery. . . . .	1.44	1.71			.56	.56		.61	1.04	.96
Fevers. . . . .	3.82	4.09	.96	1.37	4.67	2.49	5.55	3.37	2.70	3.94
Heart, Diseases of. . . . .	4.81	7.20	5.73	10.51	4.13	5.06	3.33	5.08	4.78	3.92
Hooping Cough. . . . .				.91	.42	.52	.37	.44	1.02	1.28
Hydrocephalus. . . . .	1.43	1.37	1.91	.45	.35	1.45	.38	1.01	1.36	1.65
Kidneys, Diseases of. . . . .	.48	1.71	1.93	3.64	1.86	2.24	.74	2.02	1.89	1.89
Liver, Diseases of. . . . .	1.91	1.08	1.92	2.73	.83	1.23	1.11	1.20	1.17	1.06
Marasmus. . . . .	1.44		.96	1.80	.90	1.79		1.27	1.16	1.20
Pneumonia and Congestion of the Lungs. . . . .	12.45	5.45	6.87	5.01	6.43	9.36	7.40	7.90	7.37	7.49
Scarlatina. . . . .	10.51	10.25	3.80	3.30	9.94	11.78	7.06	9.99	7.37	2.08

Table LXIV. presents a very comprehensive summary of the proportions which the mortality from several of the most prominent causes of death, bear to the whole number of deaths from specified causes.

It will be seen that great differences in the percentages of the various causes of death, occur in the different divisions of the State.

These differences would be expected in contagious diseases, which might prevail in one locality during one year, and in another locality in another year.

But differences are also found in the causes of death which might reasonably be supposed to occur, not only in the same proportion in the same localities from year to year, but also in about the same proportion in all localities.

In the above Table, however, it should be noticed that the percentages are in proportion to number of deaths in each locality or division of the State, and not in proportion to the population.

The number of deaths reported in 1880, was larger than in any preceding year. The same number of deaths from any cause during that year, would, therefore, have a smaller percentage than during any preceding year.

In the three last columns of the Table, may be found comparisons of the percentages of the different causes of death, to whole number of deaths from known causes, for the three years 1878, 1879 and 1880.

It will be seen that there is considerable variation from year to year, in the proportion of the same disease.

Cholera infantum shows a considerably larger proportion in 1880, than in the two preceding years, notwithstanding the increased number of deaths from other causes.

Consumption shows a smaller percentage than in the two previous years, because of the increased whole number of deaths from all causes, although the number of deaths from consumption was larger in 1880 than in 1879.

Diphtheria has a largely diminished percentage, while scarlatina has a percentage considerably in excess of previous years.

## REGISTRATION RETURNS.

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The returns of deaths, as recorded in the different towns in the State in the year 1880, are without doubt more complete than during any previous year of registration in Rhode Island. That is to say, there were fewer deaths occurring in 1880, in the towns, of which no report or return was made to the town or city clerk. It is also to be remarked, that the returns of registration made to the office of the state board of health, or state registrar, by the town clerks, have been more uniform in the fullness and completeness of statement in relation to all the facts and circumstances connected with the different events of birth, marriage and death, as required by law.

There is necessarily considerable delay in publishing the registration returns of any year, for the reason that they are in a considerable proportion collected under the supervision of the town or city clerks, during the months of January and February in the year following that in which the events occurred. Nearly half of the following year sometimes elapses before the returns from all the towns are received by the state registrar, and therefore the work of classifying and tabulating is delayed. That is a labor involving great care and patience. The picking out of the different facts connected with each separate event, and recorded in hundreds of pages of manuscript, and tabulating the kinds and numbers of the same thus ascertained, under the proper classifications, is a work of months.

It will be understood, therefore, that promptness of return, and uniformity in the modes of filling the blanks, and making the annual returns to the state registrar is of great importance in the way of facilitating the work.

The following circular was sent at the close of the year 1881, to the town clerks of the several towns:

OFFICE OF THE STATE REGISTRAR,

PROVIDENCE, December, 1881.

*To the Town Clerk of the Town of ——— :*

DEAR SIR.—It is quite desirable that the returns of births, marriages and deaths from the several towns in the State should be as complete and accurate as possible. It is known that some births and deaths occur in the State that fail to be put on

record. Among other causes of such failure, the most prominent is the removal of the families in which such births and deaths occur, out of the town in which they occurred, before the collector of returns of births and deaths canvasses the town for them. This defect in regard to births can be greatly remedied by a careful inquiry on the part of every collector of returns in regard to every child of one year old and less, found, *and to be found*, in the town which he is canvassing. When the collector finds a child whose birth occurred in some other town than the one he is canvassing, he should make the same inquiries as in other cases, and record on same blank returns; the said returns to be put in the hands of the town clerk as in other cases, and recorded by him in the town record, the same as of those whose births occurred in the town, with the exception of stating the town where the birth occurred, and the State, if occurring in another State.

After the town clerk has copied the town record of births on the large registration returns, and forwarded the same to the Secretary of the State Board of Health, or State Registrar, he should then send the *collectors* small returns of births that have occurred in other towns, to the town clerks of the towns where the births occurred.

The idea is, that the losses and gains in number in the different towns will thereby be best equalized, and the whole number of births in the State more fully ascertained.

The same idea will hold good, not only as between towns, but also as between States. The children born in other States during the year preceding the canvass, and found in this State at the time of the canvass, will be about the same in number as of those born in this State and removed to another State before the canvass is made.

All children then, found in any town, whose birth occurred during the preceding year, will be enrolled in the town record of births of the town where residing at the time the canvass is made in January, and be forwarded to the State Registrar the same as those born in the town.

The collector should always be instructed to obtain returns of *all* deaths, which may come to his knowledge, whether previously reported to the town clerk or not, and if he obtains information and makes returns of deaths that occurred in other towns, and in families removed to and residing in the town which he is canvassing, at the time the returns are collected, the said returns should be recorded in the town where collected, and then transmitted to the town in which the death occurred, as in the case of births. The fees will be the same as in the ordinary returns.

Physician's certificate of cause of death should always be obtained when possible.

The necessity of exercising great diligence in obtaining correct information in regard to the vital statistics of the towns, should be strongly impressed on the minds of canvassers.

The registration returns of births, marriages and deaths which occurred in the several towns of the State, during the past year, and returnable to this office, should have the returns of each class by itself, as heretofore, that is, the births, marriages and deaths on separate blanks, and the sheets *stitched*, or otherwise fastened together in regular order as they come in the quire, and the name of the class, whether births, marriages or deaths, and name of the town from which they are sent, should be written on the first outside page.

Yours respectfully,

CHAS. H. FISHER,

*State Registrar.*

## MARRIAGES.

The radical change in the marriage laws of Rhode Island, enacted during the January session of the General Assembly in 1881, enlarged the duties of the town and city clerks in relation to the proceedings preliminary to the solemnization of the marriage ceremony, and added the item of divorce to the returns. The requirements of clergymen and others authorized by law to join persons in marriage, were also increased, and more definite restrictions imposed.

It was enacted that the new law should go into effect on the first day of July, 1881.

In order that the town clerks should be enabled to comply with the new law, it was necessary to devise a new set of blanks to meet the varying requirements.

The necessary blanks comprising the record of *intention* of marriage, the certificate of the town or city clerk or city registrar, of the fact of such intention having been recorded, and the certificate of consent of parent or guardian to marriage of minor were duly prepared and forwarded in sufficient numbers to all the town and city clerks in the State, previous to the first day of July.

The following are the forms of the blanks then sent and now in use:

Intentions of Marriage Recorded in the Town of ..... R. I.

DURING THE YEAR 188



— • • —

1. Full name of Groom?.....
2. Place of Residence?.....
3. Age in years?.... 4. Color?.....
5. Occupation?.....
6. Place of birth?.....
7. Father's name.....
8. Mother's Maiden name?.....
- Parents' Birth-places? Fa..... Mo.....
- Parents' Occupations? Fa..... Mo.....
9. Full name of Bride?.....
- (Maiden name?).....
10. Place of residence?.....
11. Age in years?..... 12. Color?.....
13. Place of birth?.....
14. Father's name?.....
15. Mother's Maiden name?.....
- Parents' Birth-places? Fa..... Mo.....
- Parents' Occupations? Fa..... Mo.....
16. No. of Marriage? Of Groom?..... Of Bride?.....
17. Widower, Widow, or Divorced? Groom?..... Bride?.....
- Date of record?.....
- To be married by.....at.....
- Name of Applicant?.....

## TOWN CLERK'S OFFICE,

No. .... 188. ....

I hereby certify that the intention of marriage between  
 ..... and .....  
 is duly recorded in this office.

..... Town Clerk.

# CERTIFICATE OF MARRIAGE.

STATE OF RHODE ISLAND.

I ~~hereby~~ *certify*, That..... and

..... were joined in Marriage by me, in

accordance with the laws of the State of Rhode Island, in the Town of.....

..... this..... day of..... A. D. 188

Attest:.....

Witnesses to the Marriage,.....

.....

N. B.—The clergyman or other person solemnizing the marriage is required to sign this certificate, and return it to the Clerk or Registrar of the town or city in which the marriage takes place, on or before the second Monday of the month succeeding the date of the marriage.

The laws of Rhode Island require at least two witnesses to be present at a marriage, in addition to the parties and the clergyman officiating. Give the names of two who were present.

N. B.—The town or city Clerk, or person officiating, will require the signatures of the Groom and Bride to their certificate, and name of witness thereto, on the reversed page. If Groom or Bride has been divorced, write "Divorced" after No. of marriage, at No 14.

When a marriage is entered in the town record of marriages, if either party has been divorced, write "Divorced" in column No. of Marriage, after the number 1st, 2d, &c., is stated.

# RETURN OF A MARRIAGE.

STATE OF RHODE ISLAND.

— . . . —

1. Full name of Groom? .....

2. Place of Residence? .....

3. Age in years? .....

4. Occupation? .....

5. Place of birth? .....

6. Father's name? .....

7. Mother's Maiden name? .....

Parents' Birth-place?..... Fa..... Mo.....

Parents' Occupation?..... Fa..... Mo.....

8. Full name of Bride? .....

(Maiden Name if a Widow?) .....

9. Place of Residence? .....

10. Age in years? .....

11. Place of birth? .....

12. Father's name? .....

13. Mother's Maiden name? .....

Parents' Birth-place?..... Fa..... Mo.....

Parents' Occupation?..... Fa..... Mo.....

14. No. of the Marriage?... Of Groom..... Div. Of Bride..... Div.

15. Color of the parties? .....

N. B.—At No. 15, state whether white, black, or mulatto. At No. 14, state whether this marriage is the 1st, 2d, 3d, &c., marriage of each. ~~Give~~ Give the middle names in FULL. ~~and~~

.....188

*We, the Groom and Bride named in the above Certificate, hereby certify that the information given is correct to the best of our knowledge and belief.*

.....Groom.

.....Bride.

Signed in presence of.....

N. B.—The above blanks must be filled, and the certificate must be signed by both Groom and Bride, and must be given to the person about to solemnize the marriage, **BEFORE** the marriage can be legally solemnized in the State of Rhode Island.



CERTIFICATE OF CONSENT TO MARRIAGE OF MINOR.

.....R. I.....188

I.....*Father,*  
*Mother,* .....of  
*Guardian,*

.....heroby give my consent to

h.....marriage with.....

of.....

.....

Witness.....

At the same time, desiring to bring to the attention of all the clergymen and other persons authorized to join persons in marriage in Rhode Island, a large number of whom had no knowledge of any change in the laws in relation to marriage, or a very imperfect knowledge if any, and also to remind the town clerks of the enlargement of their duties, the following circular was sent to all the town clerks and clergymen in the State:

(CIRCULAR K.)

OFFICE OF SECRETARY OF THE STATE BOARD OF HEALTH.

DEAR SIR:

The recent radical change of the law in relation to marriage seems to require more special notice than is given by the general report of legislative proceedings, and the publication of the Acts passed by the General Assembly.

The following rules will have reference to the duties of clergymen and town or city clerks, or city registrar, and are in conformity with the present status of the marriage law:

1. Persons may marry within the degrees of consanguinity heretofore allowed by law.
2. The marriage of idiots, lunatics, and of persons having a husband or wife living, is unlawful and absolutely void.
3. There is no legal bar to the intermarriage of whites and persons of color.
4. Any ordained minister or elder of any religious denomination, or minister of any society professing to meet for religious purposes and incorporated and sustaining a minister publicly ordained, who shall be *domiciled* in this State, and either Justice of the Supreme Court, may join persons in marriage in any town in the State; also wardens in the town of New Shoreham. It will be seen that clergymen from other States *cannot solemnize marriages* in Rhode Island.

5. No minister, elder, magistrate or warden shall join persons in marriage, unless such persons, if residents of this State, shall first present a certificate properly executed and signed by the town or city clerk or city registrar of the town or city in which such persons shall reside, and if not residents of this State, then from the town or city clerk or registrar of the town or city in which the marriage shall be solemnized, to the effect that the said town or city clerk or registrar, has duly recorded the *intention* of marriage between the parties named in the certificate, according to law; and the certificate may also bear the signatures of the Groom and Bride and witness thereto.

6. No marriage shall be solemnized if lawful objection is made thereto, until such lawful objection is removed.

7. The solemnization of marriage shall be in the presence of two witnesses at least, besides the minister or other person officiating, whose signatures shall be appended to the certificate of marriage.

8. Marriages solemnized in accordance with the forms, rites and ceremonies of the various religious denominations respectively, are valid if otherwise in accordance with law.

9. Every person authorized to join persons in marriage shall certify the time when and the place where the marriage shall have been solemnized, and shall on or before the second Monday of every month, return the certificate of every marriage solemnized by him during the last preceding month, to the town or city clerk or registrar of the town or city in which such rite shall have been performed.

10. Upon application, the town or city clerk or city registrar of the town or city in which one or both of the persons intending marriage shall reside, shall fill out a *blank return of marriage* in the form provided by the Secretary of the State Board of Health, and shall certify on the reversed side, in the blank provided, that the *intention* of marriage between the parties named as groom and bride has been duly recorded in his office.

11. No town or city clerk or city registrar shall issue any such certificate to any minor or person under guardianship, unless the consent in writing of the parent or guardian of such person shall have been first obtained thereto. The legal minority of both sexes terminates at the age of twenty-one.

12. The town or city clerk or city registrar, shall, after stating the No. of marriage, whether 1st, 2d, or 3d, etc., at No. 14, on the return of marriage filled out by him, also state on the same line whether either the groom or bride or both has or have been divorced, by writing the word—divorced, or the contraction—div., closely following the No. of marriage.

13. The town or city clerk or city registrar shall obtain the facts in relation to divorce, and to minority, and shall have power of administering an oath relative thereto, and may require the signatures of the groom and bride, one or both at his discretion, at the bottom of the return which he will fill out and certify to. But if the signatures of the groom and bride are not required by him, they must be required previous to marriage by the person performing the ceremony.

Respectfully,

CHAS. H. FISHER,

*State Registrar and Sec. of the State Board of Health.*

June 21st, 1881.



## Summary of Reports of the most prevalent acute diseases in the several towns during

JANUARY, 1881.

NAMES.	Acute Diseases										Typhoid Fever.				
	Of Brain.	Of Nasal Passages.	Of Throat.	Of Bronchiæ.	Of Lungs.	Croup.	Diphtheria.	Dysentery and Diarrhœa.	Erysipelas.	Whooping Cough.	Measles.	Mumps.	Rheumatism.	Scarlatina.	
Barrington.....		2a.	3a.	1a.	5a.	7a.	6a.						4m.	6m.	
Warren.....		4a.	5a.	1a.	4a.		5m.						2a.	3a.	
Coventry.....		1a.	2a.	3a.	2a.		4m.						5m.	5m.	
East Greenwich.....		1a.		8m.	1a.	5m.	4m.				6m.		7a.	2a.	
Warwick.....				1m.	3a.	5m.					6a.		4a.		
Little Compton.....		2m.									3a.				
Middletown.....		1a.	3m.								2a.				
Portsmouth.....		2a.	3a.	1a.	4a.					7a.	1a.		3a.	6a.	
Tiverton.....		5m.	4a.	2a.	5a.						8m.		2a.	4a.	
Newport City.....		2a.	4a.	1a.	5a.		6a.				1m.		3a.	6a.	
Cranston.....		5a.	1a.	3a.	4a.	6a.	5a.						4m.	9m.	
Cumberland.....		1a.	5a.	2a.	3a.		7a.		5m.				4a.		
Johnston.....		1a.	1a.	2a.	3a.			6m.			1m.		5a.	5a.	
Lincoln.....	8a.	3m.	4a.	3a.	3a.								5a.	5a.	
North Smithfield.....		2m.	4a.	2a.	3a.		7m.		6m.				6a.	10a.	
Pawtucket.....		4a.	2a.	1m.	4a.	5m.					1m.		6a.	8m.	
Scituate.....		1a.	3a.	2m.	4a.				7a.				4m.	6a.	
Woonsocket.....	9a.	2m.	3a.	4m.	3a.	5a.	6a.						7a.	8a.	
Providence City.....		1a.	4a.	2m.	5a.	4m.	5m.						4m.	6a.	
Hopkinton.....		1a.	2a.	3a.	2a.		5m.						7a.	8a.	
North Kingstown.....		1a.	5m.	3a.	2a.		2a.								
Richmond.....		2a.	3a.	3a.	5a.	4a.									
Westerly.....		3a.	6a.	2a.	5a.	4a.	1a.								

Figure 1, in the different columns of the Table, indicates the disease affecting the largest number of persons. Fig. 2, the next largest number, and so on. The letters following the figures denote the degree of severity; s, signifying severe; a, average, and m, mild. Towns not on the list in the Table failed to make returns.

*Summary of Reports of the most prevalent acute diseases in the several towns during*

FEBRUARY, 1881.

TOWNS.	Acute Diseases		Of Brain.		Of Nasal Passages.		Of Throat.		Of Bronchie.		Of Lungs.		Croup.		Diphtheria.		Dysentery and Diarrhoea.		Kryspelas.		Measles.		Mumps.		Rheumatism.		Scarlatina.		Typhoid Fever.		Intermittent Fever.	
Barrington.....			2a	2a	1m.	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	
Warren.....			3a	3a	7a.	4a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	
Coventry.....			3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	
East Greenwich.....			1a.	1a.	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	
West Greenwich.....			1a.	1a.	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	
Warwick.....			3a.	3a.	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	
Little Compton.....			3a.	3a.	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	
Portsmouth.....	1m.		3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	
Tiverton.....			3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	
Newport City.....			1a.	1a.	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	3a	
Cranston.....			3m.	3m.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	
Cumberland.....			1m.	1m.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	
East Providence.....			1m.	1m.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	
Johnston.....			3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	
Burrillville.....			3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	
Foster.....			4a.	4a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	
Lincoln.....			1m.	1m.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	
North Providence.....			3m.	3m.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	
North Smithfield.....			1a.	1a.	3m.	3m.	3m.	3m.	3m.	3m.	3m.	3m.	3m.	3m.	3m.	3m.	3m.	3m.	3m.	3m.	3m.	3m.	3m.	3m.	3m.	3m.	3m.	3m.	3m.	3m.	3m.	
Pawtucket.....			3a.	3a.	3m.	3m.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	
Scituate.....			3m.	3m.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	
Woonsocket.....			3m.	3m.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	
Providence City.....			3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	
Charlestown.....	7a.		3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	
Exeter.....			1m.	1m.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	
Hopkinton.....			3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	
North Kingstown.....			3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	
Richmond.....			3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	
Westerly.....	7a.		3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	3a.	

Figure 1, in the different columns of the Table, indicates the disease affecting the largest number of persons. Fig. 2, the next largest number, and so on. The letters following the figures denote the degree of severity: s, signifying severe, a, average, and m, mild. Towns not on the list in the Table failed to make returns.

*Summary of Reports of the most prevalent acute diseases in the several towns during*

MARCH, 1881.

TOWNS.	Acute Diseases	Of Brain.	Of Nasal Passages.	Of Throat.	Of Bronchiae.	Of Lungs.	Croup.	Diphtheria.	Dysentery and Diarrhoea.	Krysipelas.	Whooping Cough.	Measles.	Mumps.	Rheumatism.	Scarlatina.	Typhoid Fever.	Intermittent Fever.
Warren.....			3a.	5m.	6a.	3m.	8a.	7a.				1m.		4a.	2a.		
Coventry.....			2a.	5m.	1a.	2a.	4a.	5m.				6a.	7m.	2a.	3a.		
East Greenwich.....			3m.		2m.	1a.						3m.		4m.	1a.	5m.	
Warwick.....					2a.	1a.	4a.	3m.			1m.	2a.		3m.	3a.	6a.	
Little Compton.....	5a.		2a.		4a.	1a.								4m.			
Tiverton.....			1a.	3m.	3a.	3m.	2m.					2a.		1a.			
Cumberland.....			4m.	6a.	3m.	3m.	5a.	4m.		6a.				5m.			
East Providence.....			1a.		3m.	1a.								4m.	5m.	7m.	
Johnston.....			3m.		2a.	1a.			6m.			4a.		4m.	5m.		
Proser.....			2m.		2a.	3a.	5a.					4a.		6a.			
Lincoln.....			1a.	5a.	2a.	5m.	3m.	7m.				8m.		5a.			
Pawtucket.....			2m.	1m.	3m.	4a.	4a.										
Scituate.....			1m.	3m.	2a.	4m.	3m.				2a.			5a.	7a.		
Providence City.....	6a.		1a.	3m.	2m.	4a.	6m.	5a.		4a.	5a.			6m.	8m.		
Charlestown.....			3a.		3m.	1a.	4a.	5m.						7a.			
Exeter.....			2a.	4a.	1a.	3a.	6m.	5a.						7a.			
Hopkinton.....			3a.	1a.	2a.	3a.	4m.	5a.						8m.			
North Kingstown.....			4m.	5m.	2m.	2m.			6m.			3m.		4a.	1m.	7a.	8a.
Richmond.....			6a.	8m.	3m.	1a.	10a.	5m.						2a.	7m.	12a.	8m.
Westerly.....	6m.		3a.		4a.	1a.		5m.						4a.	9a.	11a.	11a.

Figure 1. In the different columns of the Table, indicates the disease affecting the largest number of persons. Fig. 2, the next largest number, and so on. The letters following the figures denote the degree of severity; s. signifying severe, a. average, and m. mild. Towns not on the list in the Table failed to make returns.

*Summary of Reports of the most prevalent acute diseases in the several towns during*

APRIL, 1881.

TOWNS.	Acute Diseases	Of Brain.	Of Nasal Passages.	Of Throat.	Of Bronchiae.	Of Lungs.	Croup.	Diphtheria.	Dysentery and Diarrhoea.	Rhytiditis.	Whooping Cough.	Measles.	Mumps.	Rheumatism.	Scarlatina.	Typhoid Fever.	Intermittent Fever.	Small Pox and Variceloid.
Barrington.			3a.	4a.	5m.			6m.				2a.		1m.				
Warren.			5a.	3a.	6a.			4a.				1a.	7m.	2a.				
Coventry.			4m.	5a.				2m.				3m.		4m.	6m.	5a.		
East Greenwich.			1a.	4a.				2a.				3m.		4a.	2a.			
Warwick.			5a.	5a.				2a.				3m.						
Little Compton.	3a.		2m.	3m.	1a.									4a.				
Middletown.			1a.	2m.	3m.									4m.				
Portsmouth.			1a.	4m.	1m.									3m.				
Tiverton.			1a.	3m.	2m.			3a.						4m.				
Newport City.			1a.	3m.	2a.			7m.						5m.	8m.			
Cranston.			1a.	3m.	2a.			3a.						6a.				
Cumberland.			3a.	2a.	4a.			5m.				5m.		1a.				
East Providence.	6a.		1a.	3m.	3m.			5m.						4a.	6m.			8m.
Johnston.			2a.	4m.	3a.			5m.						7m.	6m.			
Foster.			1m.	2a.	2a.			5m.				5m.		4m.		5m.		
Lincoln.			3a.	2a.	2a.			2a.				5m.		4a.	6m.	6m.	7a.	
North Providence.					3a.													
North Smithfield.			1m.	3a.	4a.			7m.							6m.			
Pawtucket.			2a.	4m.	1m.			5m.						6a.				
Scituate.			1m.	4m.	2a.			6a.				3m.		6a.	7m.	8a.		
Providence City.	9a.		1m.	4m.	2a.			3m.						6a.	7m.			
Charlestown.			1a.	4a.	2a.			5m.						6a.	7m.			
Exeter.			2a.	6a.	1a.			5a.						5a.	8m.			
Hopkinton.			3a.	2a.	1m.			6a.				3m.		5a.	5m.			
North Kingstown.			1a.	4m.	2a.			6a.						7a.				
Richmond.			2a.	2a.	1a.			6m.						7a.	6a.			
Westerly.			1a.	2a.	2a.			3m.										8m.

Figure 1, in the different columns of the Table, indicates the disease affecting the largest number of persons. Fig. 2, the next largest number, and so on. The letters following the figures denote the degree of severity; s. signifying severe, a. average, and m. mild. Towns not on the list in the Table failed to make returns.

*Summary of Reports of the most prevalent acute diseases in the several towns during*

MAY, 1881.

TOWNS.	Acute Diseases	Of Brain.	Of Nasal Passages.	Of Throat.	Of Bronchic.	Of Lungs.	Croup.	Diphtheria.	Dysentery and Diarrhoea.	Krypelias.	Whooping Cough.	Measles.	Rheumatism.	Scarlatina.	Typhoid Fever.
Warren.....				1a.	3a.				4a.				3a.		
Little Compton.....				1a.	3a.				4a.				2a.		
Cranston.....			1a.	5m.	4m.	3a.	6m.				4m.	3m.			
Cumberland.....			1a.	4m.	2a.	3m.					5a.	1a.	3a.		
East Providence.....			1a.	4m.	2a.	3m.					5m.				
Johnston.....			1a.	2m.	1m.	2m.	3m.						4m.		
Foster.....				2m.	3a.	1m.	8a.		7a.	9a.		4m.			3m.
Lincoln.....		6a.		2m.	3a.	1m.						2m.			
North Providence.....			1a.	2m.		5a.						2m.			3m.
Scituate.....		6a.	1m.	2m.		5a.						2m.			
Providence City.....			1a.	2a.	4a.	3a.	6a.	3m.	9m.		7a.	8a.	2m.	4m.	
Hopkinton.....			1a.	2a.	4a.	3a.	6a.	3m.					5a.		
Richmond.....			6a.	2m.	5m.		4m.					1m.	3m.		

Figure 1, in the different columns of the Table, indicates the disease affecting the largest number of persons. Fig. 2, the next largest number, and so on. The letters following the figures denote the degree of severity; s, signifying severe, a, average, and m, mild.

Reports from several towns not in the above Table, state a diminished amount of general sickness, and no particular disease prevailing largely.



*Summary of Reports of the most prevalent acute diseases in the several towns during*

JUNE, 1881.

TOWNS.	Acute Diseases	Of Brain.	Of Nasal Passages.	Of Throat.	Of Bronchie.	Of Lungs.	Croup.	Diphtheria.	Dysentery and Diarrhea.	Erysipelas.	Hoopink Cough.	Measles.	Rheumatism.	Scarlatina.	Typhoid Fever.	Intermittent Fever.	Cholera Morbus.
East Greenwich.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Crauston.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cumberland.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
East Providence.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Johnston.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Foster.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lincoln.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Providence City.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hopkinton.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Figure 1, in the different columns of the Table, indicates the disease affecting the largest number of persons. Fig. 2, the next largest number, and so on. The letters following the figures denote the degree of severity: s, signifying severe, a, average, and m, mild. Towns not on the list in the Table failed to make returns, except as stated below.

Reports from a number of towns not on the list, indicated a comparative immunity from acute sickness of importance.

*Summary of Reports of the most prevalent acute diseases in the several towns during*

JULY, 1881.

TOWNS.	Acute Diseases	Of Brain.	Of Nasal Passages.	Of Throat.	Of Bronchie.	Of Lungs.	Croup.	Diphtheria.	Dysentery and Diarrhea.	Krysipelas.	Whooping Cough.	Measles.	Rheumatism.	Scarlatina.	Typhoid Fever.	Cholera Infantum.	Cholera Morbus.	Intermittent Fever.
Barrington.....								2a.	1m.			4a.	8a.		6m.	2a.	3m.	5a.
Warren.....									1a.			7a.			5a.	3m.	4m.	6a.
Coventry.....									1a.						4m.	2a.	3m.	
East Greenwich.....									1m.						3m.	3m.	4m.	
West Greenwich.....				1m.			5m.	3m.	2m.			2a.				1a.	3m.	
Warwick.....									1m.					4m.		3m.	3m.	
Portsmouth.....									2a.							1a.	3m.	
Tiverton.....		3m.							1m.							2m.	2m.	
Cranston.....								6m.	1a.			5m.	4a.		4m.	2m.	5m.	6a.
Cumberland.....			6a.	3a.	5a.			4m.	2a.			5m.	4a.			3m.	1a.	
East Providence.....								7m.	1a.			5m.				2a.	3m.	
Johnston.....									1a.			5m.				2a.	3m.	
Foster.....									1a.		6m.	5m.			4a.	2a.	3m.	
Lincoln.....				4m.	8a.	5m.			1a.			5m.				2a.	3m.	
North Providence.....				3m.	6m.				1a.			5m.				2a.	3m.	
North Smithfield.....									1a.		10m.	2a.	4m.	3m.	7a.	2a.	3m.	9a.
Pawtucket.....			5a.						1a.			4a.				2a.	3m.	
Scituate.....				3m.	1a.			7m.	1a.		5m.	6m.			5m.	2m.	3m.	
Woonsocket.....				4m.	4m.				2a.						3m.	1m.	3m.	
Providence City.....								6m.	1m.			6a.			8m.	2m.	3m.	7m.
Charlestown.....		7a.	5m.			7m.		4m.	2a.		5a.	3m.	6m.	9m.	3m.	4m.	10m.	
Exeter.....									1a.							2m.	3a.	
Hopkinton.....			8m.	6a.	4m.			7m.	2a.						3a.	4a.	1a.	5m.
North Kingstown.....									1a.						3m.	3a.	4m.	
Richmond.....					4m.				1a.				5m.			2a.	3a.	
Westerly.....						7a.		4a.	3a.				6a.	8m.	5a.	2a.	1a.	

Figure 1, in the different columns of the Table, indicates the disease affecting the largest number of persons. Fig. 2, the next largest number, and so on. The letters following the figures denote the degree of severity; s, signifying severe, a, average, and m, mild. Towns not on the list in the Table failed to make returns.

*Summary of Reports of the most prevalent acute diseases in the several towns during*

AUGUST, 1881.

TOWNS.	Acute Diseases	Of Brain.	Of Nasal Passages.	Of Throat.	Of Bronchies.	Of Lungs.	Diphtheria.	Dysentery and Diarrhoea.	Erysipelas.	Whooping Cough.	Measles.	Rheumatism.	Scarlatina.	Typhoid Fever.	Intermittent Fever.	Cholera Infantum.	Cholera Morbus.
Barrington.				1m.			5a.	3m.		5m. 2a.			9a. 5m. 4m.	4m. 4a.	1a. 3a.	3m. 6a. 1a. 1a. 4m.	7a. 2a. 2a.
Coventry.								3a.			3m. 3a.						
Warwick.				5m.	5m.			3m.									
Little Compton.		6a.	1m.	3m.	3m.			1a.									
Portsmouth.								1a.									
Tiverton.				3m.	4m.		5m.	1m.						4a.		3m.	4m.
Cranston.				5a.				3a.									
East Providence.		7a.	4m.	3m.	4m.		5m. 6m. 6m.	1a. 1a. 1a.		4m.		7m.		6a. 8m.		3a. 2a. 3m.	1a.
Johnston.				3m.				1a.									
Procter.		4a.						1a.									
Glocester.				3m.	3a.	6a.		1a.			6a.	7m.		4m.	5m. 9m.	3a. 3a. 6m.	2a. 3a.
Lincoln.				4m.	5m.	8m.		2m.									
North Providence.				4m.	5m.	7a.		1a.									
North Smithfield.			3m.		5m.	8a.		1a.									
Pawtucket.				4m.	5a.	8a.		1a.									
Scituate.			4m.		3m.			1m.									
Smithfield.								1m.	5m.	6m.	7a.	6m.			9m.	2a. 3m.	3m.
Woonsocket.			3a.	5m.	4m.	8m.		1m.									
Providence City.	5a.			7m.	6m.	9a.	4m. 6a.	2a. 3m.					5m.	8m. 4a.	9m.	2m. 3m.	7a.
Charlestown.								1a.									
Exeter.			2m.	5m.		6a.		3m.				8a.		8m. 7m.	9a.	1a. 4m.	2m.
Hopkinton.			5m.	3a.			6m.	2a.							6a.	4a. 4a.	1a.
Richmond.						5m.		1a.							7a.	8m.	2a.
Westerly.							6a.	3a.					5a.	4a.		1a.	3a.

Figure 1. In the different columns of the Table, indicates the disease affecting the largest number of persons. Fig. 2, the next largest number, and so on. The letters following the figures denote the degree of severity, a. average, and m. mild. Towns not on the list in the Table failed to make returns.

*Summary of Reports of the most prevalent acute diseases in the several towns during*

SEPTEMBER, 1881.

TOWNS.	Acute Diseases	Of Brain.	Of Nasal Passages.	Of Throat.	Of Bronchiae.	Of Lungs.	Croup.	Diphtheria.	Dysentery and Diarrhoea.	Hoopling Cough.	Measles.	Rheumatism.	Scarlatina.	Typhoid Fever.	Intermittent Fever.	Cholera Infantum.	Cholera Morbus.
Barrington.....				4a.				8m.	2m.			5m.		8m.	1m.	3m.	6m.
Warren.....				1m.				6m.	1m.					4m.	2m.	2a.	4m.
Coventry.....			4m.	3a.	3m.				1m.					3a.	6m.	2a.	
East Greenwich.....					4m.			5m.	1a.				7m.				
Warwick.....			3m.		4m.				1m.				5m.				
Little Compton.....			2m.	1m.	3m.				4m.				5m.				
Portsmouth.....				2m.				1m.	1m.								
Tiverton.....								2a.	2a.			8m.		5m.		4m.	
Cranston.....				3m.				4m.	2a.			3a.				1a.	
Cumberland.....			5a.	6m.	3m.				2a.			3m.			1a.	2m.	
East Providence.....				4m.				6m.	1m.						6m.	2m.	4m.
Johnston.....				3m.				5m.	1m.						2m.	2m.	
Foster.....			3m.	2a.				4m.	1a.					8a.	9a.	5m.	
Gloicester.....	4a.			3a.	2m.				1a.			5a.	7m.		3m.	5m.	2a.
Lincoln.....				7a.	3a.				1m.			4m.			5a.		4m.
North Providence.....				1a.					1m.							3m.	
North Smithfield.....				3a.	4m.				1m.					5m.	2m.	2m.	3m.
Pawtucket.....	3a.			4a.					1m.					7a.	8m.		
Scituate.....				2m.	3m.				1m.							5m.	
Woonsocket.....	8a.								1m.					4m.		2m.	3m.
Providence City.....	7a.						4m.		1m.					9m.	5m.	2m.	
Charlestown.....				1a.	8a.		4m.		2m.				6a.	2m.		2a.	
Exeter.....			1m.	5a.	2a.		3m.							9m.			
Hopkinton.....			6m.	7a.	4m.		8a.		4a.					2a.	9a.	8a.	3a.
North Kingstown.....			1m.					1a.	4a.					3a.		2m.	
Richmond.....			1m.	5m.	2m.				6a.			10m.		4m.	8m.	7a.	3a.
Westerly.....			7a.		9a.	6a.		5m.				2a.	4a.	3m.	1m.	2a.	

Figure 1, in the different columns of the Table, indicates the disease affecting the largest number of persons. Fig. 2, the next largest number, and so on. The letters following the figures denote the degree of severity; a. signifying severe, a. average, and m. mild. Towns not on the list in the Table failed to make returns.

*Summary of Reports of the most prevalent acute diseases in the several towns during*

OCTOBER, 1881.

NAMES.	Acute Diseases	Of Brain.	Of Nasal Passages.	Of Throat.	Of Bronchiae.	Of Lungs.	Croup.	Diphtheria.	Dysentery and Diarrhea.	Krysipelas.	Whooping Cough.	Measles.	Mumps.	Rheumatism.	Scarlatina.	Typhoid Fever.	Intermittent Fever.	Cholera Infantum.	Cholera Morbus.
Barrington.....			4m.		2m.														
Warren.....			7a.		6a.		4a.	4a.	5m.							3a.	1a.	1a.	
Covenry.....			4a.	2a.	1a.			3m.	5m.				5m.			2a.	1a.		
East Greenwich.....									2m.							6m.	5m.	4a.	3m.
Warwick.....			3m.			2a.		1m.	4m.							1m.	6m.		
Little Compton.....			1m.		1m.				2m.										
Portsmouth.....			1m.		2m.														
Tiverton.....			1m.	3m.	2m.			4m.								5m.			
Cranston.....			3m.	1a.	3a.											5m.	1a.		
Cumberland.....			2a.	4a.	3a.		7a.		6m.							5m.	6m.		
East Providence.....			1m.	3m.	2m.	4m.		7m.			5m.					2m.	2m.		
Johnston.....			1m.	4m.	3a.	4a.		6m.				2m.				1a.	4m.		5a.
Foster.....						6a.			3a.			2m.				1a.	4m.		
Glocester.....				3m.	4m.			5a.	3a.			2a.					1a.		
Lincoln.....		7a.		6a.	5a.	3a.			2a.	5m.						5m.	1a.		
North Smithfield.....			2m.		1a.			8a.	3m.							4m.		2a.	3m.
Pawtucket.....			6a.	4m.	5a.	3m.	2m.		1m.							5m.			
Sutton.....									3m.							4m.			
Woonsocket.....			2a.	7a.	1a.				3m.							5m.			
Providence City.....		7a.	1m.	4a.	2a.	3a.		5m.	5m.			10m.			7m.	2m.	8m.	9m.	
Charlestown.....			1m.					6m.	5m.						10m.	2m.	3m.	4m.	
Chaplin.....			5a.	3a.	6m.		7a.	1a.	4a.							1m.	3m.	4m.	9a.
North Kingstown.....					3m.			5m.	3m.							2a.	1m.	4m.	
Richmond.....			1m.		6m.		7m.	5m.	2m.							2a.	1m.	4m.	
Westerly.....								5a.	4a.							3a.	1m.	7a.	6m.

Figure 1, in the different columns of the Table, indicates the disease affecting the largest number of persons. Fig. 2, the next largest number, and so on. The letters following the figures denote the degree of severity; a, signifying severe, a. average, and m. mild. Towns not on the list in the Table failed to make returns.



*Summary of Reports of the most prevalent acute diseases in the several towns during*

DECEMBER, 1881.

TOWNS.	Acute Diseases										Cholera Morbus.			
	Of Brain.	Of Nasal Passages.	Of Throat.	Of Bronchiae.	Of Lungs.	Croup.	Diphtheria.	Dysentery and Diarrhoea.	Hoopling Cough.	Measles.		Rheumatism.	Scarlatina.	Typhoid Fever.
Barrington.....		2a.		2a.	4m.	6a.					1m.		5m.	
Warren.....		2a.		1a.	5a.	4m.					3a.		4a.	
Coventry.....		1m.	2m.	3a.		3m.	5m.			6m.	5m.		7m.	
East Greenwich.....		2a.			4a.					3a.	5m.		5m.	
Warwick.....		1m.	4m.	2a.			4m.				4m.		5m.	
Little Compton.....		1m.	2m.	3m.		8m.	6m.				4m.		5m.	
Portsmouth.....		1m.	4a.	3m.	3m.		4m.				6a.		5m.	
Tiverton.....		1m.	5a.	2m.			4m.		7m.		6a.		5m.	
Craighton.....		1m.	3a.	2a.			4m.	4a.			7m.		5m.	
Sunderland.....		2a.	6m.	1m.			5m.				4m.		4m.	
East Providence.....		1m.	2a.	3a.			7m.				4m.		2m.	
Johnston.....		1a.	3m.	3a.							4m.		5m.	
Foster.....		1m.	3m.	2m.		4m.					4m.		5m.	
Glocester.....			4m.	5a.				2a.		1a.	3a.		4a.	7m.
Lincoln.....		1m.	7a.	2a.	6a.		6	3m.			5a.		4a.	
North Providence.....		1a.	5a.	2a.		5a.			4m.		4m.		3m.	
North Smithfield.....		1a.		2a.					6m.		4m.		5m.	
Pawtucket.....		1a.		2m.				3a.			3m.		5m.	
Selmae.....		2m.	3a.	1m.		4a.	6m.		4a.	6m.	3m.		5m.	
Woonsocket.....		1m.	5m.	2a.							3m.		5m.	
Providence City.....	7a.	2a.	3a.	2a.	6m.	9a.	5m.				6m.	8m.	5m.	8m.
Charlestown.....		1m.	3a.	7a.		4a.	2m.		4a.		7m.	6m.	4m.	
Exeter.....		2a.	1a.	1a.	5m.	3m.	6m.				7m.		1m.	
Hopkinton.....		2a.	3a.	1a.		4a.	3a.				4m.		5m.	
North Kingstown.....		2a.	3a.	1a.	5a.	3m.	4a.				4m.		1m.	
Richmond.....		3a.		7a.	7m.	5a.	4a.				4m.	1m.	6m.	9m.
Westerly.....				7a.		5a.	3m.						3a.	

Figure 1, in the different columns of the Table, indicates the diseases affecting the largest number of persons. Fig. 2, the next largest number, and so on. The letters following the figures denote the degree of severity, a. signifying severe, s. average, and m. mild. Towns not on the list in the Table failed to make returns.

## ANNUAL REPORTS OF MEDICAL CORRESPONDENTS.

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For the purpose of continuing a plan which had previously seemed to be of advantage, there was sent at the end of the year a circular to each of the medical correspondents and a number of other physicians, for a more comprehensive general report in relation to disease, presumable causes of disease, and the sanitary condition of localities during the preceding year in their respective circuits.

The following was the form of circular sent:

### CIRCULAR H.

#### OFFICE OF SECRETARY OF THE STATE BOARD OF HEALTH

PROVIDENCE, Jan. 1, 1882.

##### *To Physicians :*

A year since it seemed desirable in addition, and supplementary to, the *Monthly* returns of regular correspondents, to obtain from all respectable physicians in every section of the State an Annual Report covering the whole twelve months preceding.

The following questions will indicate the information sought, and the general plan of such report; but correspondents need not be confined to precise replies to the questions presented, all the freedom being allowable of such modifications and additions, as the circumstances or peculiarities of each locality may seem to warrant.

These annual reports are desired for the purpose of presenting the status of the public health and the sanitary conditions existing in the different sections of the State, during the year 1881, in the Fourth Annual Report of the State Board of Health.

They should be returned to the Secretary of the Board by the second week in February.

Any additional postage stamps needed to cover postage on more extended consideration of the topics suggested, or any other topic having relation to the public health, will be immediately refunded on the receipt of papers,



## QUESTIONS.

1. Name of city or town, and circuit.
2. What has been the general amount of sickness, of all kinds, in your circuit in 1881, as compared with ordinary years? If greater or less, how much? Estimated.
3. What epidemics have prevailed in your circuit during the year 1881? If any, give the names in the order of their occurrence, in regard to date; the length of time they were prevalent; the degree of severity, and the localities where they prevailed.
4. What endemic diseases, if any, have been prevalent in your circuit during the year 1881? Please describe the peculiarities, if any, and the localities where they occurred.
5. What, in your opinion, is the probable cause, or causes of the endemics described?
6. What diseases of common occurrence, not strictly endemic nor contagious, have had an unusually large prevalence in your circuit during the year?
7. What contagious or infectious diseases have prevailed in your circuit, without becoming epidemic?
8. What diseases have been attended with an unusual fatality?
9. What circumstances have occurred within your observation or knowledge, that seemed to indicate that scarlet fever, diphtheria or typhoid fever had been taken, or communicated from one person to another? A full history of known facts in detail should be given. Such history need not be confined to any particular year. State on separate sheet.
10. What localities in your circuit do you consider peculiarly unhealthy? giving names and geographical position, and the diseases most prevalent, whether endemic or otherwise, and what you consider the causes of the peculiar unhealthiness.
11. Have any changes been made, during the year 1881, in your locality, or any other locality having village characteristics, in your circuit, in relation to better drainage, more complete removal of excretæ, house refuse, garbage, &c..

and have there been any other new measures, public or private adopted, to promote better sanitary conditions? State what, if any.

12. What influence, in your opinion, had the prolonged drouth of the last half of the year 1881, in the production or promotion of diseases? And, if any, in what manner, and of what diseases?

13. Has there been, in your opinion, any advance in the public sentiment of your circuit, in regard to the importance of sanitary surroundings; or any increased interest in questions appertaining to means of preventing diseases, and promoting individual and general health? State what reasons for belief.

14. Are there any localities in your circuit which, without being considered generally unhealthy, are in your opinion promotive of pulmonary consumption, gravel, calculus, malarial or any other diseases? If any, state locality and form of disease.

Physicians receiving this circular, it is believed, will have the courtesy to fill the blank spaces between the questions in response to the same, and thus confer a favor on the State Board of Health, and show an interest in public sanitation by contributing from their knowledge, experience and observation, such statements of facts as have a practical bearing on the questions that underlie all investigation, into the causes and means of prevention of disease.

CHAS. H. FISHER, *Secretary*.

#### REPLIES TO CIRCULAR H.

The following reports, received from local correspondents of the medical profession in the several cities, towns and villages of the State, will give a good representation of the general status of the public health during the year 1881, as to the presence or absence of epidemics or endemics in the several locations, the sanitary conditions and improvements, if any, in their several circuits, and other suggestions in response to the preceding circular:

##### BRISTOL COUNTY.

1. Warren and part of Barrington.

2. The general amount of sickness of all kinds, within the limits of this town in 1881, so far as I have knowledge, as compared with ordinary years, has been about one-third less,

3. Malarial fevers prevailed in Barrington largely in September and October. No epidemics, to my knowledge, existed to any large extent.

4. None, unless the malarial fevers be so called that prevailed somewhat extensively in some parts of Barrington in September and October.

6. No diseases of common occurrence, of importance, not strictly endemic nor contagious, have had an unusually large prevalence in this town during the year.

8. No diseases have been attended with an unusual fatality.

11. No changes have been made, during the year 1881, in this town, in relation to better drainage, or more complete removal of excretæ, &c., and few, if any, new measures adopted, to promote better sanitary conditions.

14. I know of no localities in this town which are particularly promotive of pulmonary consumption, gravel, calculus, malarial or any other diseases.

OTIS BULLOCK.

1. Warren ; Barrington and Bristol, in part.

2. The amount of sickness, of all kinds, in this circuit in 1881, as compared with ordinary years, has been a general average.

3. The epidemic diseases that have prevailed in this circuit during the year 1881, although not occurring as extensive epidemics, are as follows: Scarlet Fever, in February and March, severe, restricted to few families; Typhoid Fever, in September and November, average, scattering; Parotiditis, in July and August, average, in various localities; Hooping Cough, November and December, average, in various localities; Diphtheria, September, October and November, severe, but restricted to few families.

4. There were no endemic diseases of a marked character in my practice, excepting Intermittent Fever.

5. Intermittent Fevers prevalent so generally in Barrington, can be ascribed to the low forms of vegetation accruing in shallow water, and exposed by droughts to the air.

6. Diseases of common occurrence, not strictly endemic nor contagious, that have had an unusually large prevalence in my circuit during the year are, Tonsillitis and various forms of Pharyngitis.

8. Scarlet Fever has been attended with an unusual fatality, but kept restricted to few families. In one family four deaths, in another three.

9. A case of Scarlet Fever occurred in a family in the eastern part of Warren. A member of the family working in the mill here, tended a loom or mule in close vicinity to a Mr. H., and in two weeks members of the family of the latter, though living in Barrington, and remote two miles, (no other cases within a mile or so) were attacked, with three deaths in the latter, four deaths in former.

10. Attention has been paid to the most unhealthful parts of Warren, and the result is that diseases appearing here are scattered, and have no definite locality.

11. The Warren Manufacturing Company have given considerable attention to the care of districts owned by them, by removing excrete, refuse, &c., and repairing passages and lanes. The Cutler Manufacturing Company also have improved grounds very much.

12. Could not perceive any particular influence occasioned by the drought, unless the Intermittent and Remittent fevers were an example.

13. The proposed introduction of water from the Kickimuit river will, in all probability, be a decided sanitary benefit to the town, as well water is modified by the brackish influence of the neighboring sea water.

14. There are no localities in my circuit, which, without being considered generally unhealthy, are promotive of pulmonary consumption, gravel, calculus, malarial or any other diseases.

G. L. CHURCH.

1. Bristol.

2. The general amount of sickness, of all kinds, in my circuit in 1881, has been about the same as in previous years.

3. No epidemics have prevailed in this locality during the year 1881.

4. No strictly endemic diseases have been prevalent in this town during the year. Some cases of Typhoid Fever. No peculiarities about the cases, and they occurred in different localities in town.

5. Probably owing to impure water which contained organic matter.

6. Catarrh has had an unusually large prevalence in this section during the year.

7. The only contagious or infectious disease that has prevailed in this circuit, without becoming epidemic, was Typhoid Fever.

10. I do not know of any one locality more unhealthy than another.

11. There have been no changes made during the year 1881, in this locality, in relation to better drainage, or more complete removal of excretæ, house refuse, garbage, &c.

12. The drouth had no influence in the production of disease in this town, on the contrary, we had a remarkable healthy season.

13. There has been no advance in the public sentiment in regard to the importance of sanitary surroundings as a means of preventing disease.

14. I do not know of any localities in this section which, without being considered generally unhealthy, are promotive of pulmonary consumption, gravel, calculus, malarial or any other disease.

T. H. SHIPMAN.

#### KENT COUNTY.

1. East Greenwich and adjoining towns.

2. The general amount of sickness, of all kinds, in my circuit in 1881, as compared with ordinary years, was rather under the average.

3. Early in the year, April and May, we had Measles and German Measles, but mild; some local epidemics of Scarlet Fever confined to families, in June and July; nothing more than this.

4. We have had no especial endemics, with perhaps the exception of the cases of Intermittent Fever, to be mentioned elsewhere.

6. In the spring and fall an unusual prevalence of Catarrhal Influenza.
7. The contagious or infectious diseases that have prevailed in my circuit, without becoming epidemic, were Scarlet Fever, to a limited degree, and Measles and Rotheln.
8. No diseases have been attended with an unusual fatality.
9. The cases of Scarlet Fever which occurred in June, — six in one family, two fatal, — were apparently introduced by a child, convalescent of the disease, or supposed to be well over it, and this has been the most frequent way of its introduction in my experience.
10. We have no localities in this vicinity especially unhealthy.
11. No changes have been made during the year 1881, in this locality, in relation to better drainage, or more complete removal of excretæ, house refuse, &c.
12. The prolonged drouth of the last half of the year 1881 had no noticeable influence in the production or promotion of disease.
13. No particular change in public sentiment with the people generally. The attempt at improvement in the condition of affairs of this kind in the newer and better class of farm houses, has, I think, often led to serious mischief, like the covering over the old fashioned open sink-drain and receptacle, near the back door, and substituting an underground pipe and covered cess-pool, with an opening for an overflow, but without any trap. The accumulated gases are, in certain directions of the wind, pressed back into the house with great force, contaminating the air of the kitchen and every room leading from it, sometimes making itself perceptible in the uppermost sleeping rooms. In the old way there was nothing of this.
14. The western slope of the ridge extending from Greenwich north to Apponaug, has a very different soil and drainage from the eastern, and the atmospheric influences would, I think, have a marked effect upon one of consumptive tendencies, but no data have yet been collected.

J. H. ELDRIDGE.

1. East Greenwich and vicinity.
2. The general amount of sickness, of all kinds during 1881, was less; probably not more than three-quarters the usual amount.
3. No epidemics have prevailed in this circuit during the year 1881.
4. The only endemic disease of importance prevalent in this town during the year 1881, was Fever and Ague, near our print works, on a side hill near the brook and near a marshy piece of land.
5. The probable cause of the endemic was the emanations from the marshy land.
6. No unusually large prevalence of any particular disease.
7. The contagious or infectious diseases which prevailed in this circuit, without becoming epidemic, were Typhoid Fever, Scarlet Fever, Diphtheria, Pertussis, Parotiditis, and Rubella.
8. No diseases have been attended with an unusual fatality.
9. In a family of five children one was taken with Scarlet Fever, in about a

week the other four came down with it within three days of each other, showing that they contracted it of the first. Other similar cases have occurred. Have not seen a single case of Typhoid Fever that was contracted from another person during the year 1881. Have seen diphtheria contracted by different members of same family.

10. The lower streets of this village are more unhealthy than the upper streets. Diphtheria and Scarlet Fever prevail more on the lower streets, and the disease is more virulent. Typhoid Fever rarely occurs in this village, and when it does is on the lower streets. Typhoid Fever prevails more in the country with farmers that throw out slops round the house, and where they have the well on lower ground than the out buildings.

11. No changes have been made during the year, in this locality, in relation to better drainage, and no public measures adopted to promote better sanitary conditions.

12. No particular influence was occasioned by the prolonged drouth of the last half of the year, in the production or promotion of diseases. The latter part of the season was, generally, the most healthful, but in a few instances Typhoid Fever was traced to a well that was low, and in one instance a form of Typho-Malarial Fever was apparently caused by some stagnant ponds getting dry that had not been dry for years. The ponds were not far from the house.

13. I have not observed any advance in public sentiment in regard to the importance of sanitary surroundings; or any increased interest in means of preventing diseases.

14. In the direction of Warwick, if any.

E. G. CARPENTER.

1. Warwick; Centreville to Phenix and surrounding villages.

2. The general amount of sickness, of all kinds, in 1881, as compared with ordinary years, was less; about ten per cent.

3. Scarlet Fever, Diphtheria, Varicella, Pertussis, Harrisville and Phenix in the spring, mild type; Diphtheria, throughout the year; Varicella, autumn; Pertussis, winter; quite severe all through the villages. Very few cases of Typhoid Fever, less than known for years.

4. No endemic diseases have been prevalent during the year.

6. Rheumatism has had an unusually large prevalence during the year.

8. No diseases have been attended with an unusual fatality.

9. Scarlet fever and Measles communicated through the schools and families. Nearly every case of Diphtheria could be traced to defective drainage or other bad sanitary surroundings.

10. Localities along the river bank on low ground. Diphtheria, Rheumatism. The former through defective drainage, and the latter from moisture and evaporation.

11. As a general thing people have paid more attention to their sanitary surroundings, and have frequently called attention to the condition of their neighbors' premises where nuisances existed, or were supposed to exist. No new measures adopted by the town.

12. In my opinion the prolonged drouth of the last half of the year had no influence in the production or promotion of diseases.

13. Some advance in public sentiment in regard to the importance of sanitary surroundings, and interest in means of preventing diseases, has been shown by constant enquiries and personal attention to premises.

ALBERT G. SPRAGUE.

1. Coventry; Pawtuxet valley villages.

2. The general amount of sickness of all kinds in 1881, as compared with ordinary years, was somewhat less.

3. No epidemics have prevailed during the year. In the early part of 1881 there were some cases of Scarlet Fever, Measles, Mumps, and Chicken Pox, all of a mild character.

4. No endemic diseases have been prevalent during the year.

6. No diseases have had an unusually large prevalence during the year.

7. The contagious or infectious diseases that have prevailed without becoming epidemic, are Pertussis, Scarlet Fever, Measles, Mumps, and Chicken Pox, of a mild form and moderate number.

8. No diseases have been attended with an unusual fatality.

10. I regard the circuit in which I practice ordinarily healthy; will compare favorably with the healthiest localities in Rhode Island.

11. I know of but one, and that an improvement in the highway between Quidnick and Anthony, affording better drainage.

12. The prolonged drought of the last half of the year 1881 had no influence in the production or promotion of diseases. It was the healthiest six months I ever knew here.

13. I have seen no evidence of any advance in public sentiment in regard to the importance of sanitary surroundings.

14. There are no localities in my circuit which, without being considered generally unhealthy, are promotive of pulmonary consumption, gravel, calculus, malarial or any other diseases.

JOHN WINSOR.

1. Pontiac, Warwick, and part of Cranston.

2. The general amount of sickness, of all kinds, in this circuit in 1881, has been about the same as in past years.

3. Measles prevailed in and about Pontiac and Hill's Grove. Of a severe type, one fatal case.

4. Malarial Fevers. There was one case of Putrid Scarlet Fever, and fatal, no other cases occurred in the locality; this was in Pontiac.

7. No contagious or infectious diseases have prevailed in this circuit, without becoming epidemic, except Scarlet Fever.

8. No diseases have been attended with an unusual fatality.

9. In the above named case of Scarlet Fever, the child who died played with

some toys given her by a child two years previous, said child having just had Scarlet Fever. The toys were laid away in an old trunk most of the time during the two years. This is the cause I gave for the contagion.

10. I know of no locality in my circuit peculiarly unhealthy.

11. Since the year 1879 the village of Pontiac has been kept very much cleaner, refuse matter, &c., being removed nearly every day, so now we seldom have Typhoid Fever. Formerly had a great deal.

12. The prolonged drouth seemed to me to promote bowel complaints.

13. As to any advance in public sentiment, in regard to the importance of sanitary surroundings, I know of none in particular, unless the fact of keeping the streets very much cleaner may be so construed.

14. I think Pontiac, on account of being made land to a great extent, is promotive of both Malaria and pulmonary diseases, the latter because it is so very damp, and a number of cases coming to my knowledge having originated in Pontiac.

DAN. O. KING.

#### NEWPORT COUNTY.

1. Newport.

2. The general amount of sickness of all kinds in this circuit, in 1881, has not been above the average of previous years, and has been certainly less than during the year 1880.

3. A slight epidemic of Diphtheria existed in the spring of a very fatal form. The greater per centage of those affected died. The disease was chiefly confined to a limited locality, and in each case the sanitary surroundings were bad. In one family there were three fatal cases, the disease being contracted by visiting a family in which there were two cases, also fatal, and being allowed to see the remains of one of the children who died of the disease. The only other epidemic has been Scarlet Fever, which has existed in a mild form during the last few months of the year. Very many of the cases were strictly traceable to other cases.

4. Zymotic and endemic diseases have not prevailed to any great extent during the past year. During the summer months Diarrhoea in a very mild form prevailed to a greater degree than during the previous four or five years. There was also a slight amount of Dysentery and Typhoid Fever.

6. No diseases of common occurrence, not strictly endemic or contagious, have had an unusually large prevalence in this circuit during 1881.

7. Two cases of Small Pox occurred during December, 1881. One case, a woman, contracted the disease at Fall River; recovered. The other, a seaman, contracted the disease in Philadelphia, which did not manifest itself till his vessel arrived at Newport. This case proved fatal.

8. No disease has been attended with unusual fatality.

9. Number 9 is answered in reply to number 3.

10. The old portions of the city and harbor front are the localities which may be considered most unhealthy, on account of bad sanitary surroundings, badly



constructed cesspools, and impure well water. The immediate harbor front is rendered unhealthy from the fact that most of the city sewers empty into the harbor among the wharves, the formation of the inner harbor being such that the sewerage matter is not fully carried out by the tide.

11. During 1881 no radical improvement has taken place in the drainage of the city, although an unusual number of sewers have been constructed. These sewers have all been laid without any reference to a general plan. During the latter part of the year there was a decided improvement in the method of removing the excretæ, house refuse and garbage.

12. The prolonged drouth of the summer of 1881 caused an increase in the number of bowel complaints.

13. There has been a steady advance in the public sentiment, in regard to the importance of sanitary surroundings. A large portion of the community are earnestly urging the formation of a Board of Health, and are seeking to improve the sanitary condition of the city. In the spring of 1881, a lengthy petition, signed by many property holders, was sent to the city council, praying for a Board of Health. This desire has been met by decided opposition from the city authorities. The National Board of Health is having made under its supervision an inspection of all summer resorts, and in the summer of 1881 sent Mr. Ernest W. Bowditch to inspect the sanitary condition of our city. Mr. Bowditch's report has not yet been published, and I am therefore unable to give the results of his investigations. By his analysis of the water of seventy wells scattered throughout the thickly settled portions of the city, he found a vast majority unfit for use. During the past year, the very important question of the possibility of the germs of disease being carried by ice has been under investigation by Prof. Raphael Pumpelly. This investigation was made at the request of the Sanitary Protective Association of this city, in order to determine the purity of the ice taken from a pond into which drained the overflow from the cesspools of several premises. His analysis showed that the germs of disease contained in water were not destroyed by the process of freezing, and that the ice also contained a greater amount of impurity than the water from which it was formed. The ice examined was taken from the centres of blocks. Prof. Pumpelly says: "I am inclined to think that there is more danger of ice carrying contamination than the water from which it is frozen, for the following reasons: In the warm weather sewage and other organic matters coming into a pond is much more rapidly oxidized and dissipated than in winter, when the process is very much retarded by the low temperature. For this reason ice formed on such a pond should contain, it would seem, a considerable larger amount of contamination than the water would have in the summer." A practical result of this investigation has been that an impure ice supply for our city, has had its sanitary defects remedied, so that in the future this ice supply will be good. The Sanitary Protective Association of this city, an account of which organization appeared in the last annual report of the State Board of Health, is continuing to gain strength and influence. It now numbers over 80 members, and is doing practical work in improving the sanitary condition of the homes of its individual members, and showing the community the importance of a radical change in the supervision of the sanitary condition of the city.

14. There are no localities in this circuit, which, without being considered generally unhealthy, are in my opinion productive of pulmonary consumption, gravel, calculus or malaria.

FRANCIS H. RANKIN.

1. Little Compton.
2. The general amount of sickness of all kinds, in 1881, as compared with ordinary years, was about one-third less.
3. No epidemics have prevailed in my circuit during the year.
4. No endemic diseases have been prevalent during the year.
6. No one particular disease more than another.
7. The contagious or infectious diseases that have prevailed in my circuit, without becoming epidemic, are Measles and Scarlet Fever.
8. No diseases have been attended with an unusual fatality.
9. I know of a family whose little boy ran the risk of Scarlet Fever contagion. He was immediately taken to his grandmother's, some five miles away; in due time he came down but had the fever light. His sister was very anxious to see him, and at the end of four weeks she was allowed to go out to the farm, when she kissed him and played with him; in less than ten days she herself was sick with Scarlatina Maligna and died.
10. I do not think that for the past year there has been any particular locality in town peculiarly unhealthy; people are getting more careful.
11. Some changes have been made during the year, in this locality, in relation to better drainage, more complete removal of excreta, house refuse, and some effort to promote better sanitary conditions. Keeping cellars free from decomposed vegetables; removing sink-drains from near localities to wells; having the privy farther away from same and keeping the vault clean.
12. The prolonged drouth of the last half of the year had no effect in the production or promotion of diseases. Much to my surprise I had no patients of the eleven hundred that it seemed to have any influence on.
13. I think there has been some advance in public sentiment in regard to the importance of sanitary surroundings. "For by their works ye shall know them;" and I think that will apply here.
14. There are no localities in my circuit which are particularly promotive of pulmonary consumption, gravel, calculus, malarial or any other diseases, but I am of the opinion that our heavy sea fogs are as injurious as anything to many of our residents who have tendencies to pulmonary complaints.

ISAAC B. COWEN.

1. Tiverton.
2. The general amount of sickness, of all kinds, in this circuit in 1881, has been about twenty per cent. above the average of other years.
3. Measles prevailed during the early months of the year, which were of mild variety. A few cases of Diphtheria during November and December.
4. During the fall there were a few cases of Typhoid Fever (sporadic).
5. During the last part of the summer very little rain fell, and the streams, wells, and all sources of water supply were very low, in many cases cut off.
6. No diseases of common occurrence, not strictly endemic nor contagious, have had an unusually large prevalence during the year.

7. The contagious or infectious diseases that have prevailed in this circuit, without becoming epidemic, are Typhoid Fever, Diphtheria, and Scarlet Fever.

8. No diseases have been attended with an unusual fatality.

9. Four cases of Diphtheria developed soon after the children had visited friends in Providence, and a few cases were contracted from contact with them. Case of Miss G., who was with her sister, Mrs. ———, who died of the disease, until nearly the day of her death, shows its communicability.

10. All residences bordering upon fresh swamps and marshes I consider as being particularly liable to sickness, especially malaria, yet in these families there has been a remarkable freedom from all sicknesses, considering the location. The effluvia arising from these swamps is very noticeable to one passing over the road after sundown.

11. No changes have been made, during the year, in this locality, in relation to better drainage, or other new measures, public or private adopted, to promote better sanitary conditions.

12. Bowel troubles were prominent, and owing to the concentrated solutions of many wells were more prominent.

13. No appreciable results, and a consequent unbelief in any advance or increased interest in such questions.

14. See previous report.

E. P. STIMSON.

1. Portsmouth and adjoining towns.

2. There has been an average amount of sickness, of all kinds, in this circuit in 1881, as compared with ordinary years.

3. No epidemics have prevailed during the year.

4. No endemic diseases have been prevalent during the year.

7. No contagious or infectious diseases have prevailed largely.

8. No diseases have been attended with an unusual fatality.

10. No localities in this circuit peculiarly unhealthy.

11. No changes have been made, during the year, in relation to better drainage, or to promote better sanitary conditions.

12. The prolonged drouth of the last half of the year had no influence in the production or promotion of diseases.

14. There are no localities promotive of pulmonary consumption, gravel, calculus, malarial or any other diseases.

BENJAMIN GREENE.

#### PROVIDENCE COUNTY.

1. Valley Falls, Cumberland and vicinity.

2. The general amount of sickness of all kinds, in this circuit in 1881, as compared with ordinary years, has been ten per cent. less.

3. No epidemics have prevailed during the year.

4. Intermittent Fever during the fall of average severity.
5. No cause apparent.
6. No diseases of common occurrence have had an unusually large prevalence during the year.
7. No contagious or infectious diseases have prevailed without becoming epidemic.
8. No diseases have been attended with an unusual fatality.
9. Very few cases Typhoid Fever or Scarlet Fever and none of Diphtheria. No new facts developed.
10. No unhealthy locality in this vicinity.
11. No changes have been made during the year in relation to better drainage, or more complete removal of excretæ, house refuse, &c., and no measures to promote better sanitary conditions.
12. If it had any influence it was to diminish the aggregate amount of sickness.
13. No advance in public sentiment to my knowledge in regard to the importance of sanitary surroundings, or increased interest in means of preventing diseases and promoting general health.
14. There are no localities in this circuit which are in my opinion peculiarly promotive of pulmonary consumption, gravel, calculus, malarial or any other diseases.

G. B. HAINES.

1. East Providence.
2. The general amount of sickness of all kinds, in my circuit in 1881, as compared with ordinary years, was one-third more.
3. The epidemics that have prevailed in this circuit during the year are Pneumonia, during spring months, followed by Diphtheria, Intermittent Fevers and Scarlatina.
4. No endemic diseases have been prevalent during the year, except Intermittent Fever. Diphtheria and Scarlatina in East Providence Centre and vicinity seemed to have some reference to locality, but could be hardly called endemics.
6. No diseases of common occurrence, not strictly endemic nor contagious, have had an unusually large prevalence during the year.
7. No contagious or infectious diseases have prevailed without becoming epidemic.
8. No diseases have been attended with an unusual fatality.
10. No localities in my circuit peculiarly unhealthy.
11. No changes have been made during the year, in this locality, in relation to better drainage, or more complete removal of excretæ, house refuse, &c.
12. The prolonged drouth of the last half of the year had no perceivable influence in the production or promotion of diseases.
13. No advance in public sentiment in regard to the importance of sanitary surroundings.

14. No localities in my circuit known which are, in my opinion, particularly promotive of pulmonary consumption, gravel, calculus, malarial or any other diseases.

J. L. CHIPMAN.

1. Foster, and towns adjoining.
2. The general amount of sickness, as compared with ordinary years, was, first half of year 10 per cent. more, last half 15 per cent. more.
3. No epidemics have prevailed during the year.
6. No diseases have had an unusually large prevalence during the year.
7. No contagious or infectious diseases have prevailed, without becoming epidemic.
8. No diseases have been attended with an unusual fatality.

M. P. ARNOLD.

1. Gloucester, with parts of Burrillville and Smithfield.
2. The general amount of sickness, of all kinds, in this circuit in 1881, as compared with ordinary years, was about an average.
3. Measles very prevalent in Burrillville during autumn, and in Gloucester in December. Type of great severity in Burrillville, several fatal cases. It had been four years since last occurrence.
4. No endemic diseases have been prevalent during the year.
6. No diseases of common occurrence, not strictly endemic nor contagious, have had an unusually large prevalence during the year.
7. The contagious or infectious diseases that have prevailed in this circuit without becoming epidemic, are Diphtheria and Scarlatina.
8. No diseases have been attended with an unusual fatality.
10. There are no localities in this circuit peculiarly unhealthy.
11. No changes have been made, during the year 1881, in this locality, in relation to more complete removal of excretæ, house refuse, &c., or any other new measures, public or private, to promote better sanitary conditions.
12. The prolonged drouth of the last half of the year did not seem to have any influence in the production or promotion of diseases.

G. A. HARRIS.

1. Lonsdale, Lincoln and vicinity.
2. The general amount of sickness, in this circuit in 1881, as compared with ordinary years, was about an average.
3. Pneumonia, in March, April and May. The proportion of fatal cases was small, even aged people usually recovering. The cases were scattered, i. e. appeared in the villages and in the open country alike. Intermittent Fever, chiefly during October.
4. No endemic diseases have been prevalent during the year, unless Intermittent Fever be allowed under that term.

6. No diseases not strictly endemic nor contagious, have had an unusually large prevalence during the year.

7. A few cases of Diphtheria occurred in January; none afterwards, or, at least, none to my knowledge.

8. No diseases have been attended with an unusual fatality.

10. No localities peculiarly unhealthy, except stated as in previous reports.

11. No changes of importance have been made, during the year 1881, in this locality, in relation to better drainage, or more complete removal of excretæ, house refuse, &c., and no new measures, public, to promote better sanitary conditions.

L. F. C. GARVIN.

1. Lonsdale, Ashton and Berkeley.

2. There has been a general average amount of sickness, of all kinds, in this circuit in 1881, as compared with ordinary years.

3. No epidemics have prevailed during the year.

4. No endemic diseases have been prevalent during the year, except Malarial Fever in some localities.

5. No evident cause.

6. No diseases of common occurrence have had an unusually large prevalence during the year.

7. The contagious or infectious diseases that have prevailed in this circuit, without becoming epidemic, are Measles, Scarlatina, Diphtheria, Chicken Pox, and Typhoid Fever.

8. No diseases have been attended with an unusual fatality.

10. Do not know of any localities in this circuit peculiarly unhealthy. As yet have not discovered any.

11. No changes have been made, during the year, in relation to better drainage, or more complete removal of excretæ, house refuse, &c., and no other measures, public or private adopted, to promote better sanitary conditions, except the introduction of Abbott Run water.

12. There was more sickness in the last half of 1880, than during the last half of 1881.

13. I do not think there has been any advance in the public sentiment of this circuit, in regard to the importance of sanitary surroundings; or any increased interest in means of preventing diseases.

14. I think there are no localities in this circuit, which are unusually promotive of pulmonary consumption, gravel, calculus, malarial or any other diseases.

A. E. KEMP.

1. Cranston, and southerly portions of Providence.

2. During the first six months of 1881 no one disease prevailed to any extent as an epidemic. There was some sickness of most all kinds, but the amount was below the average for the corresponding season for the last five years. The latter six months was above the average for the last five years.

3. No epidemic except as in reply to question 4. There was some Diphtheria during the first six months, also some Scarlatina, some Measles, more or less Whooping Cough. Pneumonia prevailed to some extent, though not in a grave form; some lung complications with Whooping Cough. All the above seemed to prevail as *sporadic cases*. But, after the first of July, Intermittent Fever took the field and held it against all other diseases. Not one case of Dysentery; not one case of Typhoid Fever; no Lung Fever; no Diarrhœa; no Cholera Morbus; a few cases of Cholera Infantum; but one could see in every instance more or less traces of *malarial taint* as the ruling feature of the disease.

4. The only endemic disease that has prevailed in my circuit during the year was *Malarial Fever*, in its varied forms and types. Intermittent "*Malarial Fever*" began to develop itself the very last of June and continued to prevail in that peculiar type until the last day of October as an epidemic. I attended during these four months one hundred and forty-eight cases of well defined Intermittent Fever, (Ague, Chills and Fever). During the last two months of the year it changed its form and type to *Remittent Malarial*; about fifty cases. The circle described is rather an oblong one, and its elongation east and west is two miles plus; its average breadth is probably one mile and a quarter. The population comprised within this circle I should say would not vary much from 4,000. Much of the earthy deposit, fully two-thirds, is alluvial — sandy or gravelly, resting mostly on a base of black alluminous structure mingled with chip-stone, mostly gneiss, which is well nigh impervious to water. About one-fourth of this circle ( $\frac{1}{4}$ ) is in the city limits, and the other three-quarters in Cranston. The Fenner quarry is located on the north western limits of the circle, and is open on the south eastern side of the Arlington highlands. This quarry is located in wet soil with a watery base; is seamy, and many of the seams are open and more or less impacted with earthy deposits. This quarry is open and ranges from northeast to southwest, a quarter of a mile in length and almost perpendicular, from forty to seventy-five feet in height. There has been more cases in the immediate vicinity of this quarry than in any other locality by far in proportion to the number of the inhabitants. I make these statements of facts in order that you can draw your own conclusion. In accordance with what some of the eminent writers have said this might be considered a tangible source of malaria. Then there is one other supposed source I wish to draw your attention to, and that is this: there has been drawn over Cranston street for the last two years, until last fall, on an average two hundred tubs a day, (of twenty-five gallons each), of the contents of privy vaults, cess-pools, and other decomposing matters of all kinds, and deposited either in piles, or heaps, uncovered, or spread broad cast over the surface of most of the vacant lots throughout this circle. Now, the question is, whether so much of this foul material becoming absorbed in this porous soil, until it reaches to the impervious base, and then is given off as a more intensified poison, would result in true malarial miasm. I do not know as there is anything of the kind, but I suggest it as a subject worthy of consideration. I have looked the subject through and I must confess that I think we must look for the cause of this malarial outburst of fever from some other source than either of the four ponds, of which so much has been said. Much of the land where this material has been deposited has not been disturbed or broken up for some time. This may not be a fruitful source of malaria, still, I think it should be taken into account and considered, with other probable causes.

5. I speak of the diseases which have occurred within my circuit of practice.

But the malarial disease has prevailed within a circle, the largest diameter of which would not exceed two miles and a half and the lesser not over one and a half miles, two-thirds of which is located in the north eastern part of Cranston, and the other third embracing territory opposite, within the city limits. The causes which have provoked this, or these, diseases, to me is undefinable. There are four ponds within the circle, but I cannot be made to believe that either of them had but little, if anything, to do with its production. The land is mostly alluvial; subsoil sandy; on a base alluminous, mixed with chipped gneiss, and is well nigh impervious. Then there is a large quarry which, according to authors, might contribute to the work.

6. There have been some cases of gastro-enteric troubles, confined mostly to a class of patients under ten or eleven years of age. But most of these cases might be attributed to, or were the direct result of, malarial taint. There were some few cases of Bronchial Catarrh. Early in the year there was considerable Influenza.

7. There have not been any diseases that have prevailed as epidemics except Malarial Fever. Whooping Cough has prevailed during the year, but rather in sporadic form. Measles have not been very prevalent. Very little Diphtheria in a grave form. Some Cerebra Spinal Meningitis.

8. No diseases have been attended with an unusual fatality.

10. The location embracing that district around the Sprague Print Works might, I think, be set down as an unhealthy locality. I do not think, however, that this spot above referred to is naturally an unhealthy place, but the population is largely composed of foreigners, and many of them of rather a low grade, perfectly careless and indifferent as to their modes of living, regimen, habits of cleanliness, filthy yards and houses, bad water, with many other defects in their sanitary surroundings, which are of vital consequence and by all means should be corrected.

11. None. There has been no improvement in this respect and I fear there never will be until some more stringent measures have been adopted whereby good, wholesome sanitary laws and regulations can be enforced. Cleanliness is one of the first laws of heaven, and it should be so on earth as well. If the people will not keep clean there should be law enough to make them do so, for no person has a right to live in such a manner as to invite disease, and instill into the air they breathe a toxical poison that will endanger the life of their neighbor.

12. It certainly did not aid in the development of disease to any great extent, unless it had some indirect influence in promoting the development of "Malarial Fever." Perhaps this might have been the case in this way: most of the land is alluvial and sandy, based on an alluminous, impervious pan. During the spring and first part of summer the season was wet. This water leached through sandy soil and was held intact on this impervious pan; then came the hot dry weather, and then followed a powerful evaporation up through the sand in the form of Malaria. I do not say that this was the case, but is certainly inferential.

13. But little special interest has been manifested in relation to the subject of sanitary improvement. A man who will not study to know and administer to his own vital necessities, in order to preserve and keep intact the vital forces that sustain the activity of assimilative force, which is a *sine qua non* in keeping up a healthy equilibrium in his own person, will certainly fail to put his own back yard in a healthy sanitary condition, much less care for that of his neighbor.



14. I think not, although I am persuaded through my own observation for many years, that the district spoken of above, that is for a mile or more around the Print Works, is peculiarly a locality wherein the disease known as Tuberculosis largely prevails. I have no doubt that persons carrying latent tubercles by moving into this district will find, after residing some time there, the growth of the tubercle largely augmented; and they will fast ripen into ulceration. I have not found an unusual tendency to gravel or calculus. Malarial disease has been spoken of in another place.

D. H. BATCHELDER.

#### REMARKS IN REPLY TO QUESTION 9.

I have been in practice between 42 and 43 years, including what time I spent in Europe, which was a gain in experience from the facilities enjoyed in observing the type of disease, and manner of treatment, inside of some forty-five different hospitals in the different nations of Europe. And yet I have thus far failed to find reliable, tangible proof, that either of the above diseases are taken or communicated from one person to another. I have treated more than twelve hundred cases of Scarlet Fever, embracing every type and form; from those of the most simple and uncomplicated to those in the highest type of malignancy; where a whole family, exposed to the same primary causes, had been prostrated in rapid succession, passing through all the stages incident to its most grave type; and not one person outside of this afflicted family had taken the disease. In the autumn of 1844 I was called to attend a family where there were six children under ten years of age. They all came down (not 24 hours between attacks) with Scarlet Fever of the gravest form, accompanied with diphtherial throats, of as true and genuine a type as I have ever witnessed. This family residence was within a very few rods of the district school-house, where gathered sixty or seventy children and youth every day, and some of them visited the sick rooms during the six weeks that the disease lingered there, and to my certain knowledge not a symptom of the disease outside the threshold of that house was witnessed by any one in that locality, while the next cases would be in some family a mile away, where they had had no connection whatever with the family who had last had the disease. It prevailed in this isolated manner for three months or more, till I had had in all a hundred and fifty cases, exhibiting as grave a type and character as I ever knew the disease to take on; and in no instance did I observe a case where the patient had taken the disease by coming in contact with any other patient.

Again, in the spring of 1858, after Scarlatina and Diphtheria had prevailed so destructively in Troy, N. Y., during the autumn and winter of 1857 and 1858, it pounced upon the people who resided in the circuit, at and within a mile of the Sprague Print Works, in a malignant form. I had six cases of Diphtheria the first week, and no two cases nearer than eighty rods of each other. It prevailed in my circle of practice from the first of March till the middle of October, skipping many intermediate families and prevailing in no regular order. During these eight months I attended about three hundred and seventy cases, mild and severe, of Scarlatina, a hundred or more of which were complicated with Diphtheria. And here, again, I was unable to detect a single instance where either of the diseases had been conveyed in a direct manner from one family to another, or from one individual to another. I had the first case of Diphtheria in March of 1858, that occurred in Rhode Island after it had received this title, "Diphtheria," by some of the eminent men of New York and Philadelphia, during its

prevalence in the city of Troy. I had seen and dealt with the disease long before—while it was known by the *unmeaning title* of *Angina Gravan*; or, *Angina Maligna*. But I am still unsettled in my own mind in relation to the true and legitimate cause of Diphtheria, and, in fact, that of Scarlatina. I can only repeat (what I have gathered from my long experience) and what I think to be the truth, that the cause is in the form of a mysterious agent, which is invisible and beyond the chemist's grasp. It is certainly one of the imponderable agents, known only by its effects; floats only in the atmosphere, and not traceable beyond that medium, to a definite source. Hence, I am persuaded to believe, from facts gathered from every outward source, and my own experience as well, that a person is no more liable to take the disease in the room of the patient than they are in the surrounding atmosphere of the community wherein it prevails. I was called once, some 20 years since, to a little patient, ten years of age, one of five children in the family. I diagnosed the case as Scarlatina well developed. Out of the five children in the family only two had it, the first very severe, and the second only light. In another family, less than fifteen rods distant, there were four children, who were sent away on the same day, six miles distant, to avoid catching the disease. Between four and five weeks after leaving their own home I was called to see one of the four children, which I found very sick with Scarlatina and Diphtheria, apparently of malignant type. Before the week closed they were all four of them seized with the disease in like manner with the first one, which died, while the other three barely recovered.

Now, within a stone's throw of where these children were so sick, there were eleven children under twelve years of age, who had most of them frequented this house, and played with each other up to the time they were stricken down, and not one of them took the disease, or had a symptom of it. It may be said that there might be complete isolation afterwards, but this was not the case, for the neighbors went in and out every day, and watched with the children at night, and if the theory holds good that it is communicated from one person to another, it does seem to me that some of those exposed children would have taken it. Within a circle of about five miles diameter I had, in about three months, about seventy cases, and most of them well marked and severe, and in no case was I able to determine the fact that one person had taken the disease from another. Now, it does appear at least, reasonable, that this most *subtle*, imponderable agent may exist, locally circumscribed and fractionally limited, in *space* and *quantum*, mysteriously changing place, coming in contact with one or more families, skipping others as the case may be, till it spends itself, or passes on in its course to other localities. Or, it may become so diffuse as to impregnate the atmosphere throughout an extensive territory, coming in contact with well-nigh every family resident therein. In the latter case one family is just as much exposed, and as likely to take on the disease as another; that is, if they are alike susceptible; while in the former case, those families which happen to reside in its track are really the only ones exposed. I do not say that a person would not take the disease, under any circumstances in the sick room. What I mean to say is this: admitting, as all do, that the cause is somehow mingled with the elements of the atmosphere, then it follows that it may be universally diffused throughout a given territory, one child is just as much exposed, if they reside in that section, as another, the only difference arises from unlike constitutions, and their variable susceptibilities.

D. H. B.

## TYPHOID FEVER.

In relation to Typhoid Fever being communicated from one person to another, I have not been able to discover any facts going to prove, unequivocally, the affirmation of the case. So far as my experience goes to prove anything, it would assist in establishing the theory that the disease is not generally communicated from one person to another in the sick room. I have observed its workings through a period of forty years or more—having had more than one thousand cases to deal with—and am unable to bring forward a single case where the patient took the disease from being exposed to other patients in the sick room. I can bring to mind two cases, where the servant girls, who did the housework outside the sick room, and had nothing to do in the sick room except the emptying the vessels containing the *alvins discharges*. They had each a slight run of Typhoid Fever. I am not under my present impressions disposed to believe that a perfectly well person is very liable to contract the disease by going in and out of the sick room.

D. H. B.

1. Johnston, North Providence, Smithfield, and adjoining towns.
2. The general amount of sickness, of all kinds, in my circuit in 1881, as compared with ordinary years, was as follows: first half more; last half less than usual, and altogether much less than formerly.
3. Scarlet Fever in Stillwater and vicinity; not as severe as sometimes.
4. No endemic diseases have been prevalent during the year.
6. No diseases of common occurrence, not contagious, have had an unusually large prevalence during the year.
7. The contagious or infectious diseases that have prevailed in my circuit, without becoming epidemic, are Scarlet Fever, Diphtheria, Typhoid Fever.
8. No diseases have been attended with an unusual fatality.
9. I have *no doubt* but those diseases referred to are *contagious*, and that the *safety* of the *public* require certain measures to prevent their spread; but that *anybody* knows *just how* or *what* to do, I very much question. I sincerely wish I could throw *some light* on the subject, but cannot do so from any light I have.
10. There are no localities in this circuit peculiarly unhealthy.
11. I believe many improvements have been made, and with good results. The people are, I think, waking from the *old* to *new ideas*.
12. As a rule I have always considered that *drouths* or the *reverse* had much to do with health, but this year I could not see any results.
13. I think there has been, as I have said above, quite a stir in the matter.
14. It may be there are localities in this circuit, which, without being considered generally unhealthy, are becoming promotive of malarial diseases. The question, however, is not well settled.

J. C. BUDLONG.

1. Pawtucket, Lincoln and Cumberland.
2. The general amount of sickness, of all kinds, in this circuit in 1881, as compared with ordinary years, has been about an average.

3. No epidemic has prevailed in this circuit during the year, save Measles, in the early part of the year, originating in 1880.

4. No endemic diseases have been prevalent in this immediate circuit during the year.

6. No diseases of common occurrence, not strictly endemic nor contagious, have had an unusually large prevalence during the year.

8. No diseases have been attended with an unusual fatality.

10. There are no localities in this circuit which I consider peculiarly unhealthy.

11. No changes have been made, during the year, in this locality, in relation to better drainage, or more complete removal of excretæ, house refuse, &c., and no other new measures, public or private adopted, to promote better sanitary conditions, except the extended use of Abbott Run water.

12. The prolonged drouth of the last half of the year 1881, had no influence in the production or promotion of diseases.

A. A. MANN.

1. North Scituate, and parts of adjoining towns.

2. The general amount of sickness, of all kinds, in this circuit in 1881, as compared with ordinary years has been 10 per cent. greater.

3. Whooping Cough prevailed extensively in the village of North Scituate and vicinity, during the early part of the year, and Chicken Pox in same locality during the fall months, both of mild type.

4. No endemic diseases have been prevalent in this circuit during the year.

6. The diseases of common occurrence, not strictly endemic nor contagious, that have had an unusually large prevalence during the year, are Inflammatory Rheumatism and Pneumonia.

7. No contagious or infectious disease has prevailed without becoming epidemic, except Diphtheria.

8. No diseases have been attended with an unusual fatality.

10. No localities in this circuit peculiarly unhealthy, except as reported last year.

11. No changes have been made, during the year, in this locality, in relation to better drainage, or more complete removal of excretæ, house refuse, &c.

12. The following negative facts are the only ones noted: During the latter part of the summer, and the fall of 1880, there were a large number of cases of Typhoid Fever, which were ascribed in part to the drouth of that year; during 1881 (same period), notwithstanding the drouth, there was a remarkable absence of such cases.

13. No advance in public sentiment, in regard to the importance of sanitary surroundings, or increased interest in means of preventing diseases.

14. No localities in this circuit, which are peculiarly promotive of pulmonary consumption, gravel, calculus, malarial or any other diseases.

W. J. SMITH.

1. Smithfield, and surrounding towns.
2. The general amount of sickness, of all kinds, in this circuit in 1881, as compared with ordinary years, was rather less; say an eighth ( $\frac{1}{8}$ ) less.
3. No epidemics have prevailed in this circuit during the year.
4. No endemic diseases have been prevalent during the year.
6. No diseases of common occurrence have had an unusually large prevalence during the year.
7. No contagious or infectious diseases have prevailed in this circuit.
8. No diseases have been attended with an unusual fatality. The death rate has been low.
10. There are no facts to show positively that there are any localities in this circuit peculiarly unhealthy.
11. I know of no general or special sanitary improvements during the year.
12. I can say nothing here very definite; the continued drouth may have given rise to an increase of general sickness during a few succeeding months from its termination.
13. I think there has been a little advancement in public sentiment on sanitary questions within this circuit; it having arisen, no doubt, from a greater general enlightenment on matters pertaining to this subject.
14. I am not able, from any observations of my own, to refer to any localities within this circuit, which seem to furnish more than their proportional amount of the above diseases.

R. P. EDDY.

- 1 Woonsocket and adjoining towns.
2. The general amount of sickness, of all kinds, in this circuit in 1881, as compared with ordinary years, was slightly greater.
3. Whooping Cough has been very prevalent all over the town; Measles less.
4. No endemic diseases have been prevalent in this circuit during the year, within my personal knowledge.
6. Bronchial affections have had an unusually large prevalence in this circuit during the year.
7. No contagious or infectious diseases have prevailed, except as stated above.
8. No diseases have been attended with an unusual fatality.
10. In lower portions of town, along river banks, where heavy fogs prevail in spring and fall, there are always more of pulmonary and bronchial complaints; and I think the same locations have shown more Typhoid Fever.
11. No changes have been made during the year in this location, in relation to better drainage, or more complete removal of excretæ, house refuse, &c., and no new public measures to promote better sanitary conditions.
12. There was not, I think, so much of sickness, of all kinds, as was to have been expected after the late fall and early winter rains following so much dry weather.

13. While the general sentiment may not be much better, I personally know, from intercourse with them, that many individuals are beginning to think and discuss sanitary measures.

14. There are certain portions of the town, lying upon one of the hills, where for many years some form of disease of urinary organs prevails. Several deaths from Bright's disease and Diabetes Mellitus also, and quite a number of cases of each now existing. Consumption prevails not so much in any particular locality, but rather among a certain class of laborers, viz.: rubber boot makers.

GEO. W. JENCKES.

1. Providence city.

2. The general amount of sickness of all kinds in this city, in 1881, as compared with ordinary years, was as follows: First four months about 10 per cent. greater; second four months an average, and last four months 10 per cent. less.

3. No epidemics having universal prevalence occurred.

4. No endemic diseases have been prevalent during the year 1881, except Intermittent Fever, which occurred largely in the southwest part of the city.

6. The diseases of common occurrence, not strictly endemic nor contagious, that have had an unusually large prevalence during the year, are Pneumonia and Bronchitis.

7. The contagious or infectious diseases that have prevailed in the city without becoming epidemic, are Diphtheria, Scarlatina, Whooping Cough, Measles, Typhoid Fever and Mumps.

8. The diseases that have been attended with an unusual fatality are Pneumonia and Bronchitis.

11. Water has been more largely introduced, and the sewerage of buildings considerably extended. The rules in regard to the sale of unwholesome provisions have also been made more efficient.

12. The drought of the last half of the year, seemed to have no influence in the production or promotion of diseases.

13. Some advance in public sentiment seems to have been made, in regard to the importance of sanitary surroundings, and increased interest in questions appertaining to means of preventing diseases, and promoting individual and general health. Increased inquiry on the part of the general public as to best means of house drainage and ventilation, larger sale of sanitary publications, and enlarged subscriptions to sanitary periodicals.

C. H. FISHER.

#### WASHINGTON COUNTY.

1. Hope Valley, and parts of Exeter and Richmond.

2. The general amount of sickness, of all kinds, in this circuit in 1881, as compared with ordinary years, has been about an average.

3. No epidemics have prevailed in this circuit during the year.

4. No endemic diseases have been prevalent during the year.

6. The Diseases of common occurrence, not strictly endemic nor contagious, that have had an unusually large prevalence during the year are, Pneumonia, Rheumatism, Croup and Inflammatory Sore Throat.

7. The contagious or infectious diseases that have prevailed without becoming epidemic, are Diphtheria, Scarlet Fever and Measles.

8. No diseases have been attended with an unusual fatality.

10. No localities peculiarly unhealthy.

11. No changes have been made during the year, in this locality, in relation to measures to promote better sanitary conditions.

12. Intermittent Fever has prevailed to some extent, apparently as the result of bogs, and the bottom of ponds and reservoirs being exposed to the action of the atmosphere by low water.

13. No advance in public sentiment of this circuit in regard to means of preventing diseases, and promoting individual and general health.

14. No localities in this circuit particularly promotive of pulmonary consumption, gravel, calculus, malarial or any other diseases.

E. P. CLARK.

1. Hopkinton; parts of Richmond, Charlestown and Westerly.

2. The general amount of sickness in my circuit, for the year 1881, has been greater, I should say, by one-sixth than an average.

3. We have had an epidemic of Diphtheria in Ashaway, Potter Hill and vicinity; also in the village of Niantic during the last quarter of the year, of unusual severity, extending over a period of some four months; also of Typhoid Fever, in the village of Plainville, (Richmond,) of the average severity, but no fatal cases, extending through the last five months of the year; also of Varicella.

4. We have had no endemic diseases prevalent during the past year.

6. The diseases that have prevailed to an unusual extent during the past year are, Dysentery, Diarrhœa, Rheumatism and Follicular Tonsillitis.

7. The contagious or infectious diseases that have prevailed in this circuit, without becoming epidemic, are Scarlet Fever and Pertussis.

8. Diphtheria has been unusually fatal.

10. No localities in this circuit peculiarly unhealthy.

11. There have been no changes made during the past year, in my circuit, either public or private, that would ensure better drainage, &c.

12. During the prolonged drouth of the last half of the year the streams were very low, especially the river at Potter Hill, which was kept unusually low for a period of five or six weeks; at or near the expiration of this time, two or three cases of Diphtheria, of a very severe type, originated in families living on or near the banks of the pond. The remaining children of the families were allowed to attend school, and the consequence was, that almost before we knew it, we had the disease spread through the whole neighborhood. At the earnest instigation of the local physicians the school was closed for a period of three weeks, in the months of September and October, and in this way it was checked, not, however, until several lives were lost.

13. There has been no advance or increased interest in sanitary surroundings during the past year.

14. I know of no localities in this circuit peculiarly unhealthy.

A. B. BRIGGS.

1. South Kingstown.

2. There has been an average amount of sickness of all kinds, in this circuit in 1881, as compared with ordinary years.

3. No epidemics have prevailed in this circuit during the year.

4. No Malarial diseases. A few cases of Typhoid Fever have occurred in the village of Peacedale, three cases on Point Judith, and perhaps one or two other isolated cases.

5. I think the cause of all these cases was in the condition of the drinking water. Wells in this locality have been low, and of the three cases in Point Judith district (all in one family) the water really "smelt bad."

6. No diseases of common occurrence have had an unusually large prevalence during the year.

7. No contagious or infectious diseases have prevailed in this circuit, without becoming epidemic.

8. No diseases have been attended with an unusual fatality.

9. Scarlet Fever I believe to be communicable, both by personal contact and by means of families. Of Diphtheria and Typhoid Fever I believe the case is different, and there must be very favoring conditions to make them to have an appearance of being contagious.

10. No localities in this circuit considered peculiarly unhealthy.

11. No changes have been made during the year, in this locality, in relation to better drainage, or to promote better sanitary conditions.

12. No more than hinted at above.

13. I think some progress has been made in the right direction, and I know of no means more adequate to the subject than the work of the State Board. Old prejudices and peculiarities die hard, and seem ever to have a catlike propensity to recover life; but Truth, though it has an inherent resurrection power, it requires the untiring support of its votaries, because of the natural tendency of the human family to choose evil rather than good.

C. E. MARYOTT.

1. Westerly.

2. The amount of sickness in 1881 has been about equal to that in ordinary years.

3. No epidemic has prevailed during 1881, yet during the last few months of the year Scarlet Fever was quite prevalent, though hardly reaching an epidemic.

4. A mild form of malaria prevailed from August to November, and no part of my circuit seemed to be exempt, yet the severer cases were usually in the neighborhood of the Pawcatuck river.



5. The same causes which produced the slight endemic of 1880, but more widely spread.

6. No diseases not strictly endemic nor contagious, have had an unusually large prevalence during the year.

7. During the early summer, eight cases of Small Pox occurred in this vicinity, distinctly traceable to two separate points. One from Little Falls, R. I., and one originating from a cloak picked up in Long Island sound and afterwards worn.

8. No diseases have been attended with an unusual fatality.

9. Nothing has occurred to change the views that I expressed in last year's report.

10. Aside from the marshy and low lands adjoining the Pawcatuck river, there is no locality which I consider particularly unhealthy from natural causes. The unhealthy condition of a few isolated places can be ascribed to uncleanness, and disregard of hygienic rules.

11. One of the mill districts, White Rock, has improved its sewerage to a certain extent.

13. Nothing, except that the town has built a pest-house, which has not been dedicated as yet.

14. Certain localities in which malarial diseases prevail, as stated in answer to No. 4.

H. N. CRANDALL.

## REPORTS FROM TOWNS.

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It is made the duty of the Secretary of the State Board of Health, to make inquiries of the town clerks, or clerks of the local boards of health, in such towns as have boards of health separate from the town councils, or separate from boards of aldermen in the cities, in relation to the general public health, and to public measures taken to promote the same, as may be seen by the following extract from the Public Statutes of 1882.

### CHAPTER 83.

SECTION 6. The Secretary of the said Board shall make inquiry from time to time, of the clerks of town and local boards of health, and practising physicians, in relation to the prevalence of any disease, or knowledge of any known or generally believed source of disease, or causes of general ill-health, and also in relation to the proceedings of the said boards of health, in respect to acts for the promotion and protection of the public health, and also in relation to diseases among domestic animals, in their several towns; and the said clerks of town and local boards of health, and said practising physicians, shall give such information in reply to said inquiries, of such facts and circumstances as have come to their knowledge.

The following circular was therefore sent to the town clerks of the several towns, acting as clerks of boards of health:

### CIRCULAR I.

#### OFFICE OF SECRETARY OF THE STATE BOARD OF HEALTH,

PROVIDENCE, Jan. 1, 1882.

*To the Town Clerk of the Town of ———:*

At the beginning of the year 1881 a circular was sent to the clerks of local boards of health (town councils or boards of aldermen, unless special boards are appointed,) in all the towns of the State, making various inquiries in regard to the sanitary condition of, and measures taken for the improvement of the same, in their several towns and localities, during the preceding year.

In compliance with section 6 of chapter 83, of the Public Statutes, it is now obligatory and quite desirable that reports should again be made by persons holding the same official positions, in regard to the same general subjects of inquiry.

The following questions are therefore presented:

1. What diseases have prevailed to an unusually large extent in your town or district during the past year? If any, please give names; first, that affecting (to the best of your knowledge) the largest number of persons; second, the next largest, and so on. Also the localities where they occurred, and the time of the year.

2. Are there any localities in your town or district which are generally believed to foster any one disease more than another? For instance, consumption, Typhoid fever, malarial disease, &c. If any, name the localities and the diseases.

3. Are there any localities which are believed to be productive of general ill-health, without resulting in special or definite forms of disease? If so, name the locality or localities.

4. Has any widely spread or largely fatal disease, contagious or otherwise, occurred among domestic animals in your town or district, during the year 1881? If any, give name or names, locality and time of occurrence.

5. What regulations have been adopted, or work of a public or private nature contemplated, commenced or completed in 1881, by the consent, or under the direction of the town council of your town, or any legally authorized health officer or board of health in the town, in relation to the promotion and protection of the public health?

An early reply is solicited.

Respectfully,

CHAS. H. FISHER, *Secretary.*

## REPORTS FROM TOWN CLERKS

*In relation to prevalence of disease, and acts for the promotion and protection of the public health.*

## BRISTOL COUNTY.

## WARREN.

1. None of any account. Last spring a few cases of Diphtheria, but less than the towns around us.
2. No localities in this town, to my knowledge, that foster any one disease more than another.
4. No widely spread or largely fatal disease occurred among domestic animals in this town during the year 1881.
5. General vaccination has taken place, especially among the Irish and French.

HENRY H. LUTHER.

## KENT COUNTY.

## COVENTRY.

1. No diseases have prevailed to an unusually large extent in this town during the past year, to my knowledge.
2. No localities in this town believed to foster any one disease more than another that I know of, or that I have ever heard of.
4. No widely spread disease occurred among domestic animals during the year.
5. No work of a public nature, under the direction of the town council, except that free vaccination has been furnished to all desiring it.

S. W. GRIFFIN.

## EAST GREENWICH.

1. No diseases have prevailed to an unusually large extent during the past year.
2. No localities generally believed to foster any one disease more than another.
4. No largely fatal disease among domestic animals.
5. A thorough vaccination of the inhabitants of the town, ordered by the town council, took place in April and May, 1881, at the expense of the town.

E. STANHOPE.

## WARWICK.

1. Do not know that any diseases have prevailed to an unusually large extent in the town, during the past year.

2. Have heard of no localities in the town generally believed to foster any one disease more than another.

4. No fatal disease among domestic animals.

5. No new measures, except free vaccination was given to all in the town who would accept of it. In some districts a great many were opposed to it. About 600 were vaccinated.

BYRON A. ANDREWS.

#### WEST GREENWICH.

1. None. A few cases of Typhoid Fever in the central part of the town, in the early part of the winter, is the only disease noticeable.

2. There are no localities in the town which are generally believed to foster any one disease more than another.

4. No widely spread disease among domestic animals in town during the year, to my knowledge.

5. Free vaccination for the school children of the town has been provided during the past year.

WM. N. SWEET.

#### NEWPORT COUNTY.

##### JAMESTOWN.

1. No diseases have prevailed to an unusually large extent in this town during the past year. There were three cases of Consumption during the spring of 1881, in different parts of the island.

2. No localities generally believed to foster any one disease more than another.

4. No fatal disease occurred among domestic animals during the year.

5. No new measures, except the town authorized free vaccination. Dr. W. A. Watson employed.

J. E. WATSON.

##### LITTLE COMPTON.

1. No diseases have prevailed to an unusually large extent during the past year.

2. No localities which foster any one disease more than another.

4. No widely spread disease among domestic animals during the year.

5. No regulations have been adopted. No board of health has been organized. The town was vaccinated by me last year, '81.

ISAAC B. COWEN.

##### MIDDLETOWN.

1. No disease has prevailed in this town to a large extent, during the year 1881. In one house, on Third Beach Road, in the southeasterly part of Middletown, three children, all under five years of age, died within a short period of one another, in the months of February and March. The cause of the death of the oldest child was returned as Scarlet Fever. The physician died before mak-

ing return of the other two deaths. Cause assigned by some to be Measles, but probably the same as in the case of the first child. I know of nothing in the locality of these deaths peculiarly favorable to disease.

2. I think of no localities which have of late years been considered as distinctively unhealthy, or engendering any particular kind of disease.

4. Domestic animals have been singularly free from disease since the beginning of the year 1881. I fail to recall a single instance of an animal affected by any contagious disease.

5. In June, 1881, the town council provided for the gratuitous vaccination of the inhabitants of this town, and especially of the school children. I am of the opinion that few adults availed themselves of this opportunity to be vaccinated, but believe most of the people of this town have been vaccinated at least once in their lives. This I infer from reports which have come to me in a general way.

ALBERT L. CHASE.

#### PORTSMOUTH.

1. No diseases have prevailed to an unusually large extent during the past year.

2. No localities believed to foster any one disease more than another.

4. No disease among domestic animals during the year.

5. The town council ordered a free vaccination of the inhabitants of the town, last summer, which was attended to.

PHILIP B. CHASE.

#### TIVERTON.

1. Measles; early months of the year.

2. No localities which are generally believed to foster any one disease more than another.

4. Chicken Cholera, spring and fall; Pink Eye in horses, winter.

5. None, except to employ a physician to vaccinate such as desire it.

GEO. N. DURFEE.

#### NEWPORT.

1. No diseases have prevailed to any very great extent. Some cases of Diphtheria, and some of Scarlet Fever, but not many families at a time, nor were they of an aggravated form, except in two or three instances.

2. Malarial diseases are unknown. The district west of the Creek, chiefly Houston avenue, is very wet and low. Many streets occupied by foreigners are not as healthy as the average, because of the habits of the residents, but the difference is not so great as would be supposed, mostly in the outskirts. The Point is without descent, but still is fairly healthy.

4. So far as known, no widely spread or largely fatal disease occurred among domestic animals during the year.

5. The new school law induced very numerous vaccinations, and a case of Small Pox near the end of the year, many more. Free vaccination had also been advertised in June. The work of sewerage the city has been pushed with great vigor, and the using of the public water is constantly increasing.

W. G. STEVENS.

### PROVIDENCE COUNTY.

#### BURRILLVILLE.

1. No diseases have prevailed to an unusually large extent during the past year.
2. No localities which are generally believed to foster any one disease more than another.
4. No widely spread disease occurred among domestic animals.
5. Health officers were appointed in this town. The town was divided up by school districts and several physicians were appointed to vaccinate the inhabitants of the town, at a certain compensation to be paid them for so doing. No returns made of their doings.

ALVAH MOWRY.

#### CRANSTON.

1. During last summer and autumn Chills and Fever were quite prevalent in some parts of the town, particularly in the Arlington district in the neighborhood of the ponds in that vicinity. There has also been a good deal of it in the Print Works villages. Scarlet Fever has been somewhat prevalent during fall and winter, but of a mild character generally speaking.

2. The ponds referred to above, some in this town and some in Providence, ninth ward, *may* have something to do with the malarial developments in this section.

4. No widely spread or largely fatal disease, contagious or otherwise, occurred among domestic animals during the year to my knowledge.

5. Free vaccination has been furnished and made as thorough as practicable. Certificates of vaccination are required of all scholars in the public schools. An effort has been made during the year past by the town council, and I think successfully, to control and regulate the depositing in the town of night soil, cess-pool contents, &c.

T. C. LAWTON,

*Superintendent of Health for Town of Cranston.*

#### CUMBERLAND.

1. Intermittent Fever prevailed to an unusual extent, at Valley Falls and vicinity, in the fall of 1881.

2. There are no localities in this town which are generally believed to foster any one disease more than another, to my knowledge.

4. No widely spread disease occurred among domestic animals during the year, to my knowledge.

5. Vaccination was authorized by town council.

HORACE A. FOLLETT.

## FOSTER.

1. No diseases have prevailed to an unusually large extent in this town, during the past year, to my knowledge.
2. No localities believed to foster any one disease more than another.
4. No disease occurred largely among domestic animals in the town, during the year.
5. No regulations, except the town council has provided for free vaccination.

GEO. W. PHILLIPS.

## GLOCESTER.

1. No diseases have prevailed to an unusually large extent during the past year.
2. No localities which are generally believed to foster any one disease more than another.
4. No largely fatal disease among domestic animals.
5. No new regulations, except there has been public vaccination, well attended to.

CHAS. W. FARNUM.

## LINCOLN.

1. No unusual disease, except Small Pox in May and June; six or eight cases, and one death.
2. No localities believed to foster any one disease more than another.
4. No largely fatal disease occurred among domestic animals.
5. No new regulations have been adopted by the town council of this town, in relation to the promotion and protection of the public health, except as follows: (Chapter 872 Public Laws, Sec. 1.) The law in relation to vaccination of children attending public schools has been fully and thoroughly enforced, and a certificate given, resulting in quite a large number of vaccinations.

WILLIAM H. GOODING.

## NORTH PROVIDENCE.

1. No diseases have prevailed to an unusually large extent during the past year, to my knowledge.
2. There are no localities in town which are generally believed to foster any one disease more than another.
4. No largely fatal disease among domestic animals during the year.
5. No regulations have been adopted by the town council, in relation to the promotion and protection of the public health, and nothing has been done in regard to vaccination. It was talked about to some extent, but the matter was finally dropped.

THOMAS H. ANGELL.



## SCITUATE.

1. No diseases have prevailed to an unusually large extent.
2. No localities which are generally believed to foster Consumption, Typhoid Fever, malarial disease, or any other in particular.
4. No largely fatal disease occurred among domestic animals.
5. No new regulations, except vaccination was ordered, this January, 1882.

D. H. REMINGTON.

## PROVIDENCE CITY.

1. The diseases that have prevailed to an unusually large extent in this city, during the past year, are Pneumonia and diseases of the respiratory passages during the first four months of the year, and Intermittent Fever during August, September and October.
2. The southwesterly section of the city favors the production of Intermittent Fever.
3. The localities which are believed to be productive of general ill-health, without resulting in special or definite forms of disease, are only those deficient in effectual and proper drainage, with unsanitary surroundings, and among the classes disposed to dissipation, of filthy habits and living on unhealthful food.
4. The Pink Eye (so called) prevailed quite largely among horses, but without large fatality, and Spinal Meningitis, also among horses, and less largely, but with much greater fatality.
5. The regulations adopted, of a public nature, in relation to the promotion and protection of the public health are as follows:

## RULE RELATIVE TO UNWHOLESOME PROVISIONS.

[Adopted August 4, 1881.]

Chapter xii of the rules and regulations of the board of aldermen, is hereby amended so as to read as follows:—

1. It shall be the duty of the superintendent of health, to visit from time to time and at frequent intervals, all places within this city where fruit, vegetables, meat, fish or other provisions liable to become decayed, diseased or unwholesome, shall be kept, offered, or exposed for sale, and if he shall find, or be informed, that any of said articles so kept, offered or exposed for sale, are decayed, diseased, or unwholesome, he shall forthwith carefully inspect the same, and if in his opinion the same are decayed, diseased, or unwholesome, he shall prepare a certificate in writing, which shall contain a true statement of the nature, condition and quantity of the same, of the place where the same were found, and the name of the owner thereof, or of the person in whose possession the same were found, and after signing said certificate in his official capacity of superintendent of health, he shall file the same in his office, and send a copy thereof to the mayor.

2. After filing said certificate in the office of the superintendent of health, said officer shall issue an order in writing directing the immediate seizure and destruction of said articles named in said certificate, which order may be executed by any of the police constables of said city, to be detailed by the chief of

police for said purpose, under the immediate supervision of said superintendent of health.

3. The officer executing said order as aforesaid, shall make immediate return, signed by him on the back thereof, of all his doings thereunder to the chief of police, who shall transmit the same to the mayor within twenty-four hours after the execution thereof.

## WASHINGTON COUNTY.

### CHARLESTOWN.

1. No diseases have prevailed to an unusually large extent in this town during the past year.

2. There are no localities in this town which are generally believed to foster any one disease more than another.

4. No widely spread or largely fatal disease, contagious or otherwise, among domestic animals during the year 1881.

5. No regulations have been adopted, or work of a public nature commenced, in 1881, by the town council of this town in relation to the promotion and protection of the public health, except in June, 1881, the town council ordered vaccination, which was performed at district school houses by A. H. Eccleston, M. D.

GEORGE C. CROSS.

### HOPKINTON.

1. The disease that prevailed to an unusually large extent in this town during the past year, was Diphtheria. Vicinity of Ashaway and Potter Hill; also vicinity of Ashville.

2. No localities known which are generally believed to foster any one disease more than another.

4. No largely fatal disease occurred among domestic animals during the year.

5. No new regulations adopted by the town council, except that the inhabitants have been vaccinated at expense of town.

E. R. ALLEN.

### RICHMOND.

1. No diseases have prevailed to an unusually large extent in this town during the past year. Has been a general time of health.

2. No localities generally believed to foster any one disease more than another.

4. No largely fatal disease among domestic animals.\*

5. As to new regulations, nothing further than vaccination in June last.

H. P. CLARKE.

## SOUTH KINGSTOWN.

1. Typhoid Fever prevailed to a somewhat unusually large extent during the fall and winter.
2. No localities which are generally believed to foster Consumption, Typhoid Fever, Malarial disease, or any other in particular.
4. No largely fatal disease occurred among domestic animals during the year.
5. Town Council ordered vaccination at school houses in 1881, which was done by Drs. C. E. Maryott and H. L. Stillman.

J. G. PERRY.

## METEOROLOGY.

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A comparison of the monthly reports of meteorological observations made in nearly all the different towns in the State in preceding years, showed, at the close of the year 1880, that the differences in the mean temperature of the atmosphere, the mean humidity, amount of rainfall and degree and frequency of fluctuation in each, were not very dissimilar.

It was then determined, that instead of calling for observations in all the towns, two locations should be selected in which the observations made would cover all the differences, whatever they might be, between the meteorological conditions of the towns lying on the sea-shore and bay, and those lying more inland.

The cities of Providence and Newport seemed to be so situated as to practically accomplish with sufficient completeness the purpose desired.

In order, therefore, to present a general summary of the meteorological conditions prevailing throughout the State, in each of the several months of the year 1881, recourse has been had to the Signal Station at Newport, under charge of Col. Wm. McGillivray, Sergeant Signal Corps U. S. Army, and the office of S. M. Gray, City Engineer of Providence.

The tables, kindly furnished from each of these sources, will be found on the following pages. The observations reported at the City Engineer's office in Providence were made at the City Hall, and at the pumping stations of the city water works in Providence and Cranston:

## CITY ENGINEER'S OFFICE, PROVIDENCE, R. I.

*Temperature, Rainfall and prevailing direction of the wind, for each month during the year 1881.*

1881.	TEMPERATURE.							Total amount of Rain or Melted Snow in inches.	Prevailing Direction of the Wind.
	Monthly Mean.	Maximum.	Minimum.	Monthly Range.	Greatest Daily Range.	Least Daily Range.	Average Daily Range.		
January.....	22.1	43.	4.	39.	35.	7.	16.1	6.80	N. W.
February.....	27.2	51.	—4.*	55.	40.	8.	15.6	7.30	S. N. N. W.
March.....	36.8	53.	25.	28.	18.	3.	11.1	6.30	
April.....	43.9	73.	22.	51.	28.	5.	17.2	1.88	N. W.
May.....	58.0	89.	35.	54.	34.	4.	20.2	2.72	Variable
June....	63.0	85.	45.	40.	31.	4.	17.8	7.35	N. W.
July.....	70.9	87.5	56.	31.5	25.	10.	17.9	4.93	Variable
August.....	70.4	91.	55.	36.	28.	5.	15.4	.59	S.
September....	67.9	96.	49.	47.	25.	6.	15.5	2.44	Variable
October.....	55.8	86.	31.	55.	47.	10.	20.9	2.97	Variable
November....	42.7	67.	19.	48.	25.	5.	14.9	5.60	N. W.
December....	37.9	61.	12.	49.	37.	6.	17.7	4.08	Variable

\*Below zero. Mean temperature for the year 1881 was 49.6° Fah. Total amount of rain or melted snow, 52.96 inches.

NOTE.—The maximum and minimum thermometers are not read on the Sabbath; therefore the daily ranges were computed, considering the reading from Saturday to Monday as one.

## SIGNAL SERVICE STATION, U. S. A. NEWPORT, R. I.

*Temperature, Rainfall and prevailing direction of wind, for each month during the year 1881.*

1881.	TEMPERATURE.							Total amount of Rainfall or Melted Snow (inches).	Prevailing Direction of Wind.
	Monthly Mean.	Maximum.	Minimum.	Monthly Range.	Greatest Daily Range.	Least Daily Range.	Average Daily Range.		
January .....	26.1	48.5	5.0	43.5	21.0	9 0	14.0	5.70	W.
February .....	29.4	50.0	-2.0*	52.0	26.5	8.0	15.0	8.28	N. W.
March .....	37.4	53.0	25.5	27.5	20.5	6.0	11.2	8.24	W.
April .....	42.7	62.5	22.5	40.0	28.0	7.0	15.3	2 11	W.
May .....	54.2	85.2	39 0	46.2	33.2	5.4	13.4	2.90	S. W.
June .....	61.4	82.4	44.8	37.6	21.5	5.6	14.9	5.94	S. W.
July .....	68.8	86.9	57.5	29.4	20.9	5.9	13.8	0.87	S. W.
August .....	68.7	85.1	53.6	31.5	20.1	4.9	12.4	0.86	S. W.
September .....	66.7	88.3	51.0	25.6	23.2	4.9	11.9	2.65	S. W.
October .....	56.3	77.9	38.8	44.1	26.7	4.2	14.6	2.46	S. W.
November .....	46.1	62.8	20.3	42.5	24.6	4.6	13.8	5.52	S. W.
December .....	40.6	60 0	15.3	44.7	33.0	6.4	13.8	3.41	S. W.

Mean temperature of the year 1881, 49.9 deg. F. Total amount of rain and melted snow, 48.94 inches.

\*Below zero.

WM. MCGILLIVRAY,

*Sergeant Signal Corps U. S. A.*

*Examined and corrected at the office of the Chief Signal Officer, U. S. A., Washington, D. C., April 21st, 1881.*

## CATTLE COMMISSION.

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No widely spread or largely fatal disease occurred among the domestic animals of the State, during the year 1881.

### ANTHRAX.

In the month of May there were several localities in which horned cattle just turned out to grass, were seized with chills (though not always noticed), followed by lassitude, indisposition to eat, or move about, tremblings more or less apparent, and occasionally death in from six hours to six or eight days. In some localities the proportion of deaths was a small fraction of the whole number sick, while in other localities the fatal cases comprised the larger part of the entire number affected.

Such occurrences have been naturally alarming to the owners of stock in the near vicinity of such places, and not infrequently the owners of animals thus affected have had strong suspicions that they had been poisoned.

The disease is not an epizootic of a contagious character, and therefore likely to spread largely, but seems to be due entirely to local infection or influences, and not communicable to animals at a distance from the premises where the disease originates. The disease does not occur in the same place year after year as might be expected, and the cause is enveloped in considerable obscurity.

The disease is sometimes called by veterinary physicians splenic apoplexy, from the fact that in all cases where examinations have been made after death, the spleen of the animal was invariably found enormously enlarged, and filled with black, tarry blood, uncoagulable, and having the appearance of having undergone decomposition before the death of the animal. The spleen was also in a softened state, easily torn, and in some cases scarcely holding together when held up by one end.

No other structural change was invariably found, and not infrequently no other pathological condition.

Whether the disease is caused by some malarial emanations from the low grounds where it has always originated, or is caused by some minute vegetable growth, fungus, smut or mildew, on or with the grasses upon which the cattle feed, is now only a matter of conjecture. It was the design of the Secretary to have given this disease a particular investigation during the year, and a more extended description in this Report, but other duties were more pressing, and the opportunity was not found.

#### GLANDERS.

The usual care and attention in the direction of the discovery of glandered horses, has been continued through the year.

The following remarks from the last previous report, will apply equally well in the present connection:

The difficulty in detecting the disease in its earliest stages from the similarity of the symptoms to other nasal diseases, with the frequent disposition of the owner upon discovery of suspicious appearances to take measures to hide or remove such appearances from general observation, and especially when the symptoms of the disease are more definitely declared to dispose of the animal as soon as possible in places where the disease will be the least likely to be noticed, continues to protract the time when the animal will be reported to the Board. At the same time a large number of suspected cases are reported, which upon examination prove to be only nasal catarrh, or some non-contagious, acute or chronic disease of the nasal passages.

The number of cases reported suspected of being glanders and not found such, far exceed the number found to be glanders or farcy. The proportion of the suspected cases visited to the proven cases is more than four to one.

The tract entitled "Glanders and Farcy" has been kept in supply in places where horsemen congregate, and has been distributed singly to persons whose occupations or pursuits brought them frequently in contact with considerable numbers of horses.

The number discovered and destroyed during the year 1881 was nineteen. This was a great reduction from previous years, the number for the last four or five years running from about fifty to over one hundred. It is not probable that the year 1882 will show so small a number, for reasons given above.

Of the nineteen horses destroyed because of having glanders, nine were found in the city of Providence, three in the town of Cranston, three in East Providence, two in Lincoln, and two in Johnston.



## OTHER DISEASES.

The attention of the Secretary was called during the year to other forms of disease among domestic animals of different kinds, but with the exception of the Pinkeye and Spinal Meningitis in horses, they were of an innocuous and mild character, or limited to a single stable or farm, and were in no measure a source of danger to the property of outside parties.

The Pinkeye prevailed just at the close of the year, and was only fatal when complicated with some other disease, and Spinal Meningitis, though frequently fatal, was confined to single stables.

In the discovery of glandered horses, the Secretary desires to acknowledge the valuable services of Dr. N. A. Fisher, Gen. Agent, and Charles H. Thurber, Pros. Agent of the Society for the prevention of Cruelty to Animals, Drs. Peabody and Scrutton, veterinary surgeons, and the police force of the city of Providence.

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MALARIA  
IN RHODE ISLAND.

BY

C. V. CHAPIN, M. D.,

PROVIDENCE, R. I.

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## MALARIAL DISEASE IN 1881.

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Since the first appearance of the present endemic of malaria in Rhode Island, interest in the subject has steadily increased, both among the profession and the laity. The question is asked on all sides, why is it that this exasperating enemy which we have so long escaped, should now appear in our midst. Naturally the profession is expected to answer it, but this unfortunately it is not at all able to do. To explain completely and satisfactorily the origin and cause of malarial disease, is what medical men have long been striving to do. In order to build up a theory it is necessary first to collect a sufficient number of facts to work upon, and as the advent of a new disease is manifestly the most important time to secure data concerning it, the writer felt that it would be of interest to determine the location of as many cases as possible of malarial disease occurring in Providence during the year 1881. Afterwards the privilege was granted by the Secretary of the State Board of Health, of arranging the statistics that he had been able to collect from the various towns throughout the State. Outside of Providence replies were received from twenty-nine physicians. Of these, twenty, representing fourteen towns, reported having from two to two hundred cases of malarial disease last summer. Nine physicians, representing seven towns, reported having seen no cases of the disease. It is extremely probable, also, that the remaining towns which were not heard from, were also exempt from it. The towns free from it were in the northwestern part of the State, and along the southern shore and on the islands. The various reports will now be considered in detail.

*Barrington.*—From the fact that no physician is resident in this town it is very difficult to obtain accurate statements in regard to the prevalence of any particular disease. Physicians from the neighboring towns and from Providence are called upon to furnish medical attendance, and it is only by conversation with them and with the inhabitants of Barrington that any reference can be made to malarial disease in that place.

The workmen employed at the brick-yard near Nayatt Point, were the first persons attacked in 1880, and during that summer nearly every one had, at some time, intermittent fever. The works are situated a short distance from the shore of the bay, at the head of a creek that communicates with salt water, and the whole district is very low, varying from one to ten feet above high water mark, and is covered with swamps and marshes. In 1880 nearly every one of the employees (French Canadians) were sick with chills and fever. That year a shallow pond, some quarter of a mile west of the lodging house where the workmen slept, was drained completely bare for the first time in many years. Thinking that perhaps the exposed bottom of this pond might have been the cause of the appearance of the chills and fever, the Brick Company last season determined to keep it well flowed, and also to thoroughly renovate the lodging house and its surroundings, and to import an entirely new set of hands. This was done, but intermittent fever again appeared, though it was not quite so prevalent as it was the year before. Even if the pond bottom spoken of was the chief cause in producing the cases of disease in 1880, it could scarcely be possible that it was the only cause, for the numerous swamps, pools and ponds which exist in this region present such points of similarity that it seems very probable that if one of them has anything to do with chills and fever they all have, and last summer's experience confirms this view.

At Nayatt Point, a projection of land, the highest in the town, extending into the bay, a number of cases occurred among the summer residents. There is no reason, however, to suppose that the malarial poison was developed at the Point itself, but it was probably blown over from the brick-yard, or else the people contracted the disease while riding through the swamp, to and from the depot.

At Drownville, about a mile north of the brick-yard, there were a great many cases in 1881, considerably more than the year before.

No portion of the town was entirely exempt, but it was noticed that generally more cases occurred in the immediate vicinity of the swamps than elsewhere. The soil is generally sandy and gravelly, except at the brick-yard, where it is, of course, clayey. There was no especial excavating in progress besides that connected with the manufacture of bricks. On the whole, it will probably be admitted there was more malarial disease in Barrington in 1881 than in 1880.

*Cranston.*—Dr. King reported five cases of malarial fever on high land, not far from the Print Works. Dr. Batchelder reports having a very large number in this town during 1881. He attended in Cranston about one hundred and fifty cases of malarial disease, besides

fifty just over the line in Providence, which were situated in the Mashapaug Pond district, and will be considered in the statistics of that section. Nearly a quarter of these cases were of a remittent type, the others typically intermittent. Fifty cases of malarial disease occurred in and around the villages at the Print Works, while the remainder extended, in somewhat decreasing numbers, westward from the city line towards that point. The larger number was clustered around what is known as Fenner's Quarry, situated on the eastern slope of a considerable hill, and distant perhaps three quarters of a mile from Spectacle Pond, the marshy condition of which will be described further on. Notwithstanding the fact that this hillside has a considerable elevation above the neighboring fields, Dr. Batchelder describes the soil as "wet and springy, and covered in places with rank vegetation." Indeed, the soil of the whole town is rather heavy and moist, and there are numerous ponds and wet, marshy places scattered about over its whole area, though Dr. Batchelder says that malarial disease was not any more prevalent close to such places than it was at some distance. But we must remember that the section here described is so limited that even one malaria-breeding place could easily furnish poison for all the one hundred and fifty cases reported. The fact that many of the persons attacked lived at the distance of a mile or more from a certain marsh, and a hundred feet or so above its level, does not prove that the malarial poison may not have travelled, by laws that are pretty generally admitted, from such marshy region. While malarial disease was so prevalent during 1881, it was not its first appearance, for isolated cases were noticed here the year before, as they were also just over the line in Providence.

*Central Falls.*—Four or five cases are reported here, but no definite facts in regard to them are given.

*East Greenwich.*—Malaria appeared in East Greenwich for the first time in 1881. Some cases of the disease were in the vicinity of the Print Works, "near a brook and piece of swampy land, over which the mists hang nearly every night." Other cases occurred on Poto-wam Neck, and in the southern part of the town, and although the soil immediately about them was sandy and well drained, there were not far distant, "in the one place boggy land and in the other a small pond." The reporting physicians attribute the disease to the emanations from the swamps and ponds. A single case occurred at the Buttonwoods in Warwick, near a swamp.

*East Providence.*—Forty cases or more of malarial fever, mostly of an intermittent type, are reported as coming under the observation of

the physicians in this town during 1881. The most of them were in the southern part, near Barrington, and were in the vicinity of low, wet lands. Some few cases were in a more elevated region, and in the midst of apparently healthy surroundings. Some of the patients lived in the northern part of the town, near the mouth of the Ten Mile River, and some were in the immediate neighborhood of considerable excavations. The soil disturbed consisted largely of vegetable material. No causes are assigned by the physicians. A few cases were observed the year before, but none previously.

*Foster.*—One or two cases occurred, upon the banks of a stream.

*Hopkinton.*—There were a few cases, but no particulars were given as to their location.

*Johnston.*—Two cases are reported, near the Providence line.

*Lonsdale.*—From ten to twenty cases occurred here, and the physicians report that the most of them were near “low, marshy ground covered with rank vegetation, and subject to flowage and drainage.”

*Newport.*—It is said that no marked cases of intermittent fever were noticed in Newport last summer, and there is no history of any there for many years. But the physicians of the city are inclined to think that a malarial element was at work there, changing to a certain extent the character of other affections. But no one locality seems to have been visited more markedly than another.

*Pawtuxet.*—About twenty cases are reported here for 1881, of which twelve were intermittent, the rest remittent. It is its first appearance in the place. Two only of the cases were on the north side of the river, and were in the vicinity of excavations for gas and water pipes. The rest were on the south or Warwick side of the stream. The valley of the Pawtuxet is here very low, and is bordered by swamps, as are many of the little brooks which flow into the river. One case at some distance from the river was close to a swamp, and one was directly on the borders of a pond.

*Pontiac.*—Ten cases of intermittent fever were reported for this village. They were all on low land, which had been made by filling in. They were not far distant from the river, which has very low banks here, and which had an unusually small amount of water last summer. To this the resident physician attributes the appearance of the disease.

*Providence.*—A few cases of intermittent fever occurred in Providence three years ago, but none were publicly reported till the summer of 1880. There were only a few cases reported that year, probably not more than a score in all, and all of them were in one locality, the vicinity of Mashapaug Pond. During 1881 a large number of cases were reported, and in order to ascertain their exact location enquiries were made of one hundred and sixteen practitioners. Replies were received from seventy-six. Of these, thirty-four reported cases, and forty-two reported having none. Three or four physicians practicing in a region to be mentioned, had a very large number of cases each, while of the remainder scarcely any one had more than half a dozen. In all there were about three hundred and fifty-two cases reported. Probably the whole number affected by the disease was nearer twice that, as a great many sick with chills prescribed for themselves, or applied to a druggist, and so did not come under the notice of physicians.

Of the whole number of cases about two hundred and forty were within a half-mile of Mashapaug Pond. The population of this district, as nearly as could be estimated, is about twenty-five hundred, hence the proportion of those affected was nearly as one is to ten, while over the rest of the city it was not so high as one in a thousand.

The pond itself is quite deep, with bold and generally sandy shores, and the water is by no means stagnant. In the summer time, however, it is covered to a greater or less extent with a bright emerald green material, which consists of a low form of vegetable organism. This, however, so far from being a source of impurity, as many of the dwellers upon the banks of the pond supposed, really renders the water purer and sweeter than it otherwise would be. But while there are no marshes or stagnant pools along the shores of the pond itself, there are such spots in its immediate vicinity. To the south the pond empties itself by a small stream, which flows for a considerable distance through wet, swampy meadows. In the houses near this outlet and along the course of the stream many of the cases of malarial disease occurred. A few rods to the westward of Mashapaug Pond, and connected with it, is another pond of far different character, known as Spectacle Pond. This is, however, just over the line in Cranston. This pond has been raised at times above its natural level and then drawn off again, so that the shores, which were naturally marshy, have been rendered far more so. The greater portion of its borders consists of swamps, filled with more or less dead vegetable material, killed by the changes in the water level. Upon its surface may be seen some of those floating islands formed of trees, shrubs, stumps and a matted mass of roots, that occasionally form in our artificial ponds. The area affected by intermittent fever began within



a few rods of this pond, and extended northeast—the direction of the prevailing winds during the summer months, for a half-mile or so along the shore, and beyond the extremity of Mashapaug Pond. The Stonington Railroad passes through the midst of this district, and on each side of the road-bed are a number of small, stagnant pools. These are partly formed by the railroad embankment, and have a very imperfect outlet. The neighboring houses are built on their very margins, and in many cases the privies are placed directly over them. Their foul appearance during the summer time indicates that they contain a large amount of decaying animal and vegetable matter.

It was in this region that the cases of intermittent during last summer were a hundred times as numerous in proportion to the population as in all the rest of the city. But the other cases were by no means evenly distributed. Directly north of the Oriental Mill, in the north part of the city, is a shallow pool, and around its border twenty-six cases of intermittent fever were reported. Another small group of eight cases was in close proximity to a half salt, half fresh water marsh, near Red Bridge. None of the affected districts are of any elevation, and the sub-soil is sandy and gravelly. The wet and marshy places spoken of were not of recent formation, but they may have been in a somewhat worse condition than usual last summer, on account of the exceptional dryness of the season.

*Smithfield.*—Two cases occurred in the northwest part of the town, quite near mill ponds.

*Valley Falls.*—Probably there were from thirty to forty cases in and around Valley Falls last summer. The soil here is generally dry and sandy, and portions of the region affected are somewhat elevated. There are, of course, along the Blackstone River, numerous ponds and small streams, and as the summer of 1881 was an exceptionally dry one, more of the river bottom was exposed than is usual. But the physicians practicing here did not find that the majority of the cases were in the immediate vicinity of such localities. They do, however, report that the most of them were along the line of pipes carrying the Pawtucket water supply, the excavations for which were made last summer, and which, of course, necessitated the exposure of a great deal of fresh soil.

*Warren.*—The first cases occurred in this town during 1881. One physician reports from ten to twenty cases. In nearly every instance he says they occurred in the vicinity of “low, marshy tracts, or near pools which were either filled with stagnant water, or else with bottoms exposed on account of the exceptional drought.” The sub-soil was

largely clayey. None originated on elevated land. The disease was attributed to "the presence of decaying vegetation in newly opened ground, in marshy districts, and in the dry ponds."

*Westerly.*—Malarial disease had previously appeared in this town, but it was much more prevalent during the summer of 1881 than it had ever been before. A part of the cases occurred in a region bounded on one side by the Pawcatuck River — with lowlands covered with rank vegetation intervening. This tract is sometimes covered with water, sometimes bare. On another side is an extensive swamp. Another set of cases were in a region adjoining this, one of greater elevation and with a dry soil, but over which the ordinary summer breeze blew directly from the swamp above mentioned. Still other cases occurred upon the highest elevation in the town, but it is supposed that very few of them really originated there. There had been no upturning of the soil, except such as was incident to the building of a number of new houses. The physician who made the observations came to the conclusion that among the "conditions necessary for the development of the malarial poison in that town are decaying organic matter, with a certain amount of moisture and heat."

*Woonsocket.*—The physicians here report that cases have been occasionally seen for many years, but from the floating character of a large part of the population, it is probable that they did not originate within the State limits. Last summer a few cases were undoubtedly developed in the town. Some of them were on "low land (originally swampy) near sewer openings, and surrounded by filth of various kinds." In one or two instances the tenements occupied by those affected were exceedingly damp and poorly drained. Other patients lived "in the lower, if not lowest portion of the town, not far from the river, where fogs prevail." No cases are reported as developing in elevated parts of the town. The soil in the region affected is moist and clayey. One of the physicians who made the report was himself attacked by the disease, and he considers its development unquestionably to be due to imperfect drainage.

From a review of the facts above given, it appears that though a few cases of malarial disease had been noticed in the State prior to 1880, that was the first time that any serious outbreak had occurred in many years, in fact since the early settlement of the colony. During the summer of 1880 intermittent fever, which had been slowly approaching us from the valley of the Hudson, seemed to gain a firm foothold on Rhode Island soil, and a very serious endemic occurred at

the works of the Nayatt Brick Company, in Barrington. Only a comparatively few cases were reported from Providence and one or two other places. In the summer of 1881 it had certainly not decreased in Barrington, and had increased to an alarming extent in Providence and other towns which had been only slightly visited before, and appeared to the extent of a considerable number of cases, in many places hitherto exempt. The regions that were particularly affected were the low-lying portions of Westerly, the town of Barrington, the lower portion of the valley of the Pawtuxet River, together with the region drained by the streams there flowing into it, and the valley of the Blackstone, especially from Central Falls to the Massachusetts line. All these regions abound in marshes, swamps and reservoirs, subject to frequent and great change of level. The sub-soil is usually sandy and gravelly, more rarely clayey. Unusual excavations were in progress in one or two places. The streams and reservoirs were unusually low on account of the severe drought, but, on the whole, it would be rather unreasonable to say that the difference in the physical conditions of these places last summer was the cause of the prevalence of malarial disease. Neither were the atmospheric conditions so different from those of former years as to warrant the theory that we could here find a sufficient cause for the development of malaria. Almost the only general statement that can be made after a review of the reports from the several towns, is, that malarial disease first appeared in the immediate vicinity of low, wet regions, and that during last summer the *immense majority* of the cases occurred within a short distance of such places, a few occurred near excavations, and some very few apparently had no connection with either. Except in rare instances, there seemed to be no relation between the disease and imperfect sewerage. Such being the facts, let us see how they accord with current theories.

A great many views in regard to the cause of malarial diseases have been advanced at different periods. Some writers have thought it is to be found directly in meteorological conditions, chiefly prolonged heat and marked diurnal variations in temperature; others think that these affections are due to an excess of ozone in the air; others still to the development of certain poisonous gases, produced by decaying vegetable material. But by far the greater number of observers for the last thirty years, have believed that this class of diseases was due to the presence in the air we breathe, or the water we drink, of minute vegetable germs, and that these, after remaining in the body a certain time, produce the characteristics of malarial poisoning. Which one of these disputed views is correct, is, of course, not for us here to affirm, but whether it be a poisonous gas or a vegetable germ, or some other undiscovered agent, we must admit that there is a distinct and

specific malarial poison, which alone is capable of producing the class of diseases that we are here considering. Such a poison is probably somewhat similar to the poisons which produce the other infectious and contagious diseases, such as yellow fever, cholera, small-pox, measles, etc.

But while we do not know exactly *what* the immediate and efficient cause of malarial disease is, we do know very many of the conditions under which it is active.

1. Malaria, by which is meant the malarial poison, requires a period of incubation, just as yellow fever and measles do, and this may vary from a few hours to many months. The period of exposure, too, may be very brief, a very few hours is often amply sufficient. All persons are not equally susceptible. Some probably would never contract it. By constant exposure, also, persons become accustomed to this as to other poisons, they become acclimated by living in a malarious country. Unfortunately, when once taken into the system it is very difficult to get rid of. It is a curious fact that a person frequently experiences an attack immediately after removal from a malarious district.

2. Malaria is not developed until the minimum temperature rises above 57°, and so it is rare for it to appear till the summer is well advanced. It may then continue to be produced until the thermometer marks 32°, which temperature effectually checks its development. But it must be remembered that many cases that contract it in the fall do not have any manifestations till well into the winter.

3. The development of malaria requires moisture and the presence of dead vegetable matter. The favorite places for it are along the sides of swamps, marshes, pools, low and shallow rivers, and those that periodically overflow their banks. A rapid and deep stream with bold banks, and ponds with steep and sandy shores, are not usually its starting points. A superabundance of water plays the same part in preventing malaria that an entire absence of water does. Thus it is found that a marsh may be made perfectly healthy by keeping it completely covered with water. Salt water marshes do not give rise to malaria, but flats flowed by brackish water are the most dangerous of malaria-breeding places. As it has never been shown that decaying animal matter can give rise to this poison, there can be no especial danger in this regard to be apprehended from sewage.

But to the idea that the source of malaria is usually to be found in swamps and marshes, it is objected that these physical conditions have existed nearly as they are now for fifty years or more, and that during all that time they have given forth no malarial poison, and it cannot

be that they are the cause of it now. One writer says, "The mere presence of malarial disease near marshes does not prove that it originates in the marsh, any more than salmon in a river prove that the river generates the fish." Certainly not. Marshes are not the cause of malarial disease, merely one of the essential conditions for the development of the cause. If we drained the river, we should kill the salmon, and if we drained the marshes along its banks we should probably kill the cause of the intermittent fever occurring there. This, after all, is the best proof of the connection between malaria and moisture. The marked diminution in malarial disease that has taken place where wet regions have been drained, is shown by numberless instances, both in Europe and this country, and has established beyond question the relation between the two.

4. Malaria is very apt to be developed where earth is freshly turned up. Here we have plenty of decaying vegetable matter in the moist soil. When fields long undisturbed are brought under cultivation, when excavations are made for cellars, and for the laying of drains, water and gas pipes, etc., and cutting and grading is being carried on for the building of streets and railroads, malaria, if it be a malarious region at all, is quite certain to attack those engaged in the work, and even residents near by.

5. The malarial poison itself has an affinity for the soil, and the nearer we approach the ground the more virulent it is. For this reason people sleeping on or near the ground are more liable to be attacked, and people living in the upper stories of houses, or in houses a little above the level of the unhealthy district, are more free from it. Dampness and fog seem to concentrate the poison. Sunlight dispels it. But the greater liability to infection at night is chiefly from the subsidence of the wind, and the greater atmospheric moisture at that time.

6. The malarial poison can be transmitted by the wind to a distance from the place of origin. An instance is narrated where a vessel anchored over night, about two miles from shore, with a land breeze blowing, and all of the crew were attacked. Some say it can be carried as far as five miles. It will be noticed that some of the localities most severely affected in this State, as a part of Providence, were to the north of the supposed places of origin, the prevailing winds here being southerly. Trees, even in small numbers, tend to interfere with the spread of malaria. It is by this method of transportation that the disease appears at a distance from wet regions, and even at a considerable elevation on the sides of hills.

In conclusion it may be said: First, that we do not know the exact nature of the agent that produces malarial disease. Second, that we do know many facts in regard to its development and action. Third, that one of the most important factors in its production is moisture and decaying vegetable matter.

Recognizing these facts, it becomes the duty of physicians and all who have the public health at heart, to study carefully and conscientiously all the circumstances concerning the development of malarial disease in each particular locality. By so doing, means will often be found in one way or another, but most frequently by thorough drainage, to remove those conditions which favor the development of malaria. Proper drainage is a matter which, from an agricultural and purely economic view, is too little attended to in Rhode Island, and there are undoubtedly many places in the State where measures to secure drainage might be undertaken with great pecuniary advantage, to say nothing of the far more important result of greatly improving the health of the surrounding region.



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# PRENATAL EDUCATION.

BY

FRANKLIN C. CLARK, A. M., M. D.,

FELLOW OF THE RHODE ISLAND MEDICAL SOCIETY, PROVIDENCE, R. I.

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## SYNOPSIS OF SUBJECT.

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Development of race dependent upon Heredity and Education.

Discussion of the two forms of Heredity.

Province of Congenital Heredity—fixation of types.

Province of Acquired Heredity—alteration of types.

Healthy Heredity in its several aspects.

Unhealthy Heredity—

Disease and Deformities.

Insanity and Idiocy.

Crime and Pauperism.

Application of the Law of Acquired Heredity.

Maternal influences.

Province of Prenatal Education.

Healthy Condition of Mother.

Healthy Condition of both parents.

Improper Marriages.

Ill-assorted Marriages.

Consanguineous Marriages.

Environment of Mother during Gestation.

## PRENATAL EDUCATION.

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In the introductory chapter to his work entitled *Hereditary Genius* Mr. Galton well says, "I conclude each generation has enormous power over the natural gifts of those that follow, and maintain that it is a duty we owe to humanity to investigate the range of that power, and to exercise it in a way that, without being unwise towards ourselves, shall be most advantageous to future inhabitants of the earth."

Racial improvement, or rather racial development, is the one great fundamental principle of civilization, the aim of the moralist and legislator, the problem of each successive age, the vital question which should concern every individual occupying never so lowly and obscure a position in society. Just as we reap the fruits of past ages, and suffer from the mistakes of older forms of civilization, just so surely will posterity be modified by the heirloom we give them, for better or for worse. Hence it must be sufficiently obvious, that the burden of progress rests upon present living generations; that the character of future civilization is determined by the tendency inherent in modern civilization; that the consideration of the best modes of present education and racial improvement obtains in every way to the advantage of those coming after.

### THE LAW.

Heredity, which fixes and perpetuates the knowledge acquired through ages, and is a law which underlies all this racial development, is divisible into two factors, of equal importance, and mutually interdependent, namely, *congenital* and *acquired*. The first presents traits acquired in the ancestor, and prevents retrogression; the second assures further development. The one is congenital with ancestors, transmits qualities directly or indirectly to descendants, and is also congenital with descendants; the other is not congenital with ancestors, but only with descendants. It exhibits itself in those characters, psychological, moral and physical, which are due to the environment —

to the influence of habits, tastes, desires, disease, mode of life, climate, education, or any character acquired by ancestors during their lifetime from external sources, and transmitted to posterity. The best form of heredity is the one only influenced by education, and through which civilization is rendered capable of improvement. It is thus the faculties made susceptible of development are fixed in descendants; the progress of the race assured. It is this constant repetition of impressions, generation after generation, through persistent education, that old tendencies are fixed, modified or eradicated, and new predispositions created. Thus by drawing out the dormant, innate faculties by the proper means, we establish the tendency, at least, in posterity, of further improvement. And as at no other period of its existence the offspring is more susceptible of receiving impressions than through the sympathetic nervous system of the mother during gestation, the subject of *Pre-natal Education* becomes of deep interest to educators—a subject closely, and, I may say, indissolubly connected with Heredity. In fine it is a part of the law itself.

But, since congenital heredity concerns us so largely, in that it fixes and makes permanent in the offspring what has been acquired by the parent, it seems proper to consider briefly the subject of Heredity in its two forms already mentioned.

1. *Congenital Heredity.* No one, at this late day, will deny the existence of the law of heredity: it has been so well attested that we have no need in the present instance to waste time in its demonstration.

Congenital heredity manifests itself in two ways, either directly or indirectly. Characteristics and peculiarities of the most trivial sort may be transmitted from parent to child without a break, for generations; as instance the Austrian lip, a peculiar feature in the ruling family of Austria. Again, the inherited quality may be displayed only in every other generation; as in the case of some of the famous Greek athletes, where grandfather and grandson appeared to be the distinguished members of the family. Here every second generation was passed over, or it but slightly exhibited the hereditary traits. This form of heredity has been otherwise termed *heredity by alternate generation*.

Another form of congenital heredity is illustrated by cases of Reversion, as they are termed. Here a trait of ancestors two or more generations removed may reappear, not in the line of direct descent, but in a distant collateral branch of the family. Thus a grand-nephew may show characteristics belonging only to a great-uncle; and

the same thing may be seen in the case of the female members of the family. The other terms employed for the same principle, are *reversional* and *heterogeneous* heredity.

From this we can very readily perceive the enormous influence of heredity in moulding the character of future generations; and, under the best training, the liability of bad qualities cropping out, when, from the vast remove of the original source of evil, we should expect the reverse. In the same manner may be explained the exhibition of great genius, where the whole environment would seem to favor the contrary. Thus, too, may we account for a Nero, a Caligula, a Philip, Alva, and a Guiteau springing up, as it were, by the side of a Socrates, Plato, Aristides and a Garfield, and under seemingly like causes. And here it is that prenatal education comes into play, not only in benefiting the immediate, but the remote future—education being so thorough and scientific that all cases of sudden and horrible reversions will be crowded out, so to speak, and finally disappear—a better material having been produced, out of which to develop a better race of people.

Healthy, normal heredity, then, is to be especially desired. It not only betters and ennobles the individual, but transmits and perpetuates all the acquired nobility in the nation. To this active force is due each nation's peculiar physiognomy, character, tastes, habits, manners and customs, and whatever mental, moral and physical characteristics make it a distinct people. It explains the manner in which the nation is capable of improvement, and points out the way of escaping a reversion to its former savage, unhappy state. The character of the nation illustrates the character of the individual. England manifests in her present inhabitants the characteristics of her old Scandinavian and Germanic ancestors, the worshippers of Thor and Woden; the French exhibit the same peculiarity of temper, and psychological character as Caesar attributes to the Gauls, their ancestors; the modern Spartans are quarrelsome and fond of fighting, like their sires, who fought at Salamis and Thermopylæ; and the present inhabitants of Arcadia lead a pastoral like their fathers, and pasture their flocks as of old in the verdant valleys of Arcady. The peculiar features of the Chinese, and of the negro, are likewise due to inheritance. The phlegmatic Dutchman, the lethargic German, the nomadic Arab, the clannish Jew; all these, though differing so widely from each other, possess characteristics due to congenital heredity; each has congenital tastes and instincts which make them distinct peoples.\*

The same fact is observed when we enter the province of comparative heredity. Among plants and the lower animals we note the operation of the same law. Different species and different varieties

\*Ribot. *Heredity*, pp. 108-119. Also *Caesar's Gal. Bell.*, IV, 5.

are preserved and perpetuated through the influence of congenital heredity. Each species is known by certain fixed, permanent characters, which distinguish that species from all others. The same mode of leaving, budding, and fruiting in the parent plant we expect to see repeated in the descendant. From fleet horses we breed race horses; from keen-scented dogs, animals for the chase. Docile races will beget docile animals; the fierce bloodhound engenders in its offspring a taste for blood. We could not expect otherwise. Everywhere 'like produces like.' And this law breeders and gardeners have used in perpetuating new varieties, or improving the original stock.

2. *Acquired Heredity.* At the outset great difficulties stare us in the face. To this form of heredity must be attributed all the great varieties in form, tastes, and habits of race—the mental, physical, and moral characteristics of the individual. This is illustrated by the custom of breeders and gardeners when they desire to perpetuate new varieties accidentally acquired. In like manner may be satisfactorily explained (if we accept the theory of evolution) the defect or absence of certain organs, from disuse or otherwise, due to the environment. The organ from becoming less useful is less exercised, then becomes rudimental, or is done away with altogether; or there may be an improved development in faculties and organs which the environment demands.

From a survey of the above we can easily see in what direction our efforts may be turned, by way of acquired heredity, to racial development. It now remains for us to consider how far these innate physical and psychological characters may be directed, corrected and modified by education. We found that the power here rested chiefly upon the environment of the parent, and that this reacts again upon the child through maternal or parental influences. In other words, since the character of the offspring depends so much upon heredity of the congenital variety, the proper way to act upon the psychological habit of the child is through the fixation of such habit by heredity in the parent. The better the stock the better the breed.

Heredity acts thus by the accumulation of impressions constantly repeated, increasing the physical and intellectual habit in successive generations, securing by degrees a high state of intelligence in the individual, or rather creating the power of acquiring greater intelligence. But all this exhibition of intellectual character must be an outgrowth of psychological changes.\*

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\*Loc. cit., p. 320.

## OPERATION OF THE LAW.

It has been observed above that education of every kind has to do with heredity which can only be acquired. Congenital heredity fixes and perpetuates whatever has been gained. After this point is reached personal efforts may cease, for all future development ceases; perfection has been secured, and is perpetuated; the nation has arrived at the acme of its civilization. But until that time comes, new tendencies must be acquired, improved and transmitted.

Physiological development, or changes in function, tissue and organ, may be transmitted by inheritance; in other words, physiological development gives rise to physiological heredity. To illustrate: By exercise a tissue receives more blood; it increases in size, power and function. In the same way the whole system acquires tone and vigor, and becomes capable of resisting and overcoming external influences. In all descendants produced from such organisms the same power of endurance is observed. Hence a strong, vigorous, healthy individual begets a corresponding healthy offspring.

Again, this physical health reacts upon the mental habit; and we obtain a 'sound mind in a sound body.' Psychological development is thus originated, which in time gives rise to psychological heredity.\* This principle can be seen no more clearly than in normal and abnormal *acquired heredity*.

1. *Normal Acquired Heredity.* Physical development is well instanced in the case of the old Greek athletes, some families of whom seemed to carry off nearly all the rewards of victory. Several individuals of the same family exhibited this skill, such as father and son, two brothers, or grandfather and grandson, as being capable of winning in the various gymnastic festivals of Greece. Here the skill acquired by the ancestor was transmitted, directly or indirectly, to descendant.

Coming down to our own times, we find cases of celebrated oarsmen and wrestlers, who inherited their physical strength, and also transmitted it.† But yet, were these tendencies not in some degree acquired? None of their descendants could hope to acquire of themselves the power of prevailing over all competitors, unless the law of *spontaneity* may obtain, where geniuses seem to start up, not at all dependent upon any other law for their appearance. But in training those who have inherited certain tendencies, or predispositions for the athletic sports from ancestors, the results are more satisfactory than in those

\*Loc. cit., p. 276.

†Galton's *Hereditary Genius*, pp. 305-315.

who have not inherited such tendencies. A case, however, is on record of a London clerk, who outstripped all competitors in a foot race, which took place among the Scotch Highlanders, although he had received no previous training whatsoever.\* But we cannot go beyond a certain point in our physical training. After a certain limit has been reached, to transcend that limit would be dangerous, not to say fruitless, and a waste of time.

What has been said concerning the individual may be likewise applied to the nation. Its physical strength may be developed out of its individual parts. This fact is no better illustrated than by the ancient Spartans. By constant training, and the selection of the best physically constituted infants for rearing, the destruction of the sickly, feeble or deformed, and the training of the infant to live after a severe and ceaseless mode of discipline, Sparta had a hardy and invincible race of warriors. All nations, at their outset, seem to have adopted similar laws, but the Lacedemonians were preëminently physically perfect for generations.

Among the Jews we note a similar illustration of health and vigor, in their longevity, general freedom from disease and destructive plagues, and their great powers of reproduction under the most adverse circumstances. In Germany, it is estimated, a greater proportion of Jews live to their fifty-third year than do those among the Christian population.†

The psychological characteristics are so many and varied, that a few only must suffice; referring readers, for further enlightenment on this subject, to Galton's great work, and to other treatises on heredity.

Whether in regard to statesmen, judges, barristers, warriors, musicians, artists, scientists, literary men, or others, the same law is in operation. We find talents in special directions to run in certain families, and attain to greater excellence in later generations. Mozart is one instance among musicians. His father was a famous violinist, and his sister an excellent performer on the piano. But, perhaps the best example we have of hereditary musical ability is found in the Bach family. This talent extended through eight generations, first appearing in 1550, culminating in Sebastian, the great composer, in 1750, and ending in 1800, with a female descendant, a respectable musician. This family comprised more than twenty eminent individuals; one originated the present piano forte music. It is a curious fact that all the musical genius of this remarkable family was transmitted only through the male line.‡

Linnaeus had a son who was an eminent botanist; Darwin, the

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\*Loc. cit., pp. 14-15.

†Ribot, Loc. cit., p. 113.

‡Galton, Loc. cit., vid. Musicians, etc.

famous author of the theory of *Natural Selection*, had a distinguished ancestry. Among jurists, commanders, statesmen, poets and artists we note like cases of heredity.\*

Moral characteristics may likewise be acquired and inherited. Instances are abundant of the religious element predominating in certain families, giving rise to loveliness of character, or breaking out in all the glaring colors of bigotry, fanaticism and asceticism.

A nation may exhibit a similar moral habit, as the Jew, and other Shemitic peoples, in whom the religious or moral element predominates over every other feeling; their body politic being made up entirely of moral and religious precepts.

National psychological character is due to like causes; the individual determining the character of the race.

Individual peculiarities of mind and body, in education, and in those characters which do not conflict with health and normal mental habit, fall under the same law. These are of too common occurrence to need further consideration.

2. *Abnormal Acquired Heredity.* This form of heredity shows itself in the mental, physical and moral aspects like the last.

Physical anomalies comprise those cases of diseased function acquired by parents and ancestors, and transmitted in a greater or less degree to descendants. Especially is this the case with women during gestation, through what have been termed *maternal influences*; that is, peculiar qualities, tendencies, or predispositions transmitted to the unborn child through external impressions upon the mind of the mother. Under this head may be included diseases, or the tendencies to such diseases, which are hereditary, and those predispositions to certain impressions variously termed idiosyncrasies, diatheses, and inheritable tendencies. A vulgar interpretation of the same principle is the old *humor* theory, now fast losing its hold with the advance of science and common sense.

In the same class may be placed anomalies of tissue or conformation, such as monstrosities, malformations and various physical infirmities; such as double-headed and acephalous monsters, which are never perpetuated through the operation of congenital heredity; multiplicity of organs, like sexdigitism of the Colburn family, and of others known to the writer; defects and malposition of organs, and the like. The Ancon variety of sheep, with its crooked legs, which seemed to every appearance a freak of nature (*lusus naturae*), was turned to advantage by sheep breeders, so that this breed of sheep has been made permanent; the malformation becoming at length transmitted by inheritance, with no fears of reversion.

\*Ribot, Loc. cit.



All these physical anomalies, unless new and constantly increased artificial means are used for perpetuating them, have a tendency to die out. This was the case of the Ancon variety of sheep. The breed was perpetuated only by adapting the new individuals to the change of environment. Had this not been done the variety had perished long ago. Tall men, and six-fingered and six-toed individuals, if properly selected and mated, might in time give rise to tall men with an unusual supply of fingers and toes; and this through the operation of the law antagonistic to *acquired* heredity, known as *congenital* heredity. This fixes all physical changes against, as well as in harmony with racial development.

The same view may be entertained here in regard to nationalities. To illustrate this let us take for example the inhabitants of the northern side of the Pyrenees, a debased people known generally under the name of *Cagots*. They are shunned as though they were lepers. They are characterized by the smallness of the lobe of the ear, and fishy eyes. They also have an extremely fetid breath, live by themselves away from the neighborhood of villages, and are regarded with universal abhorrence. They form a wretched class of people, and transmit their defects to their descendants to this day. Yet, in spite of this, it is said, they are industrious, somewhat intelligent, and good mechanics.\*

The Gypsies offer another example of physical and mental debasement, unsusceptibility to moral improvement, due to heredity, and the unchangeableness of the environment. The character of the individual elements of both these people must be obvious to all.

In considering the subject of mental and physical decay, we must start with this postulate, that *mental power is dependent upon physical development*. The stronger the constitution, and the sounder the organs, the better the work of the mind. On the other hand, the weaker the constitution and the more enfeebled the functions, the more susceptible the mind to disease. Thus an enfeebled body is less capable of resisting mental strain; when the mind gives way, and becomes likewise diseased through the sympathetic system of nerves; and this again becomes hereditary.

Thus epilepsy, which has been induced in the ancestor during life from some morbid changes in the spinal cord, may give rise to epilepsy or insanity in the offspring. The same may be said of acquired hysteria, chorea, idiocy and hypochondria. Each of these diseased states may again be the inheritance from an ancestor subject to insanity.

We now come to the consideration of a wide and much vexed question, namely, the responsibility of those persons who commit criminal acts when laboring under some form of insanity. And it becomes the

\*Ribot, *Lec. cit.*, pp. 117-119.

more important to us, since many forms of insanity appear to be latent in ancestors, and are developed in descendants after a sufficient lapse of time; or the insane impulse may show itself at about the same age at which it was first observed in the ancestor. These inherited tendencies to mental disease constitute a subject well to be noted in the education and treatment of children possessing, or supposed to possess, insane ancestors; and if the offspring of such parents be subjected to the proper constraint and discipline, the disease may be retarded or entirely prevented from appearing, and probably from becoming hereditary.

Cretinism illustrates the subject on the national side of the question. Here idiocy, as well as physical infirmities, is a part of the national character. Healthy women, if they pass the period of gestation in infected districts, give birth to Cretin children. Children thus born of healthy parents are no more free from the disease than those of parents partially or wholly diseased. On a change of the environment the mental and physical defects of the child are greatly improved, if not wholly eradicated. This disease is fortunately confined to certain districts of the Alpine valleys. Elsewhere the affection is not observed, if we except the deformity known as goitre, or Derbyshire neck.\*

The last aspect in which we shall consider abnormal acquired heredity, will be the perversion of the moral nature. Gluttony, avarice, cannibalism, inordinate lust, showing itself in rape and unnatural crimes, depraved appetites of all kinds, and the tendency to commit robbery and murder, to become paupers, or to lead a vagabond life, have all been placed under the head of depraved moral heredity.†

The best treatise we have at present on the hereditary nature of crime is by Mr. Dugdale, in his little work on the *Jukes*. In it the history is given, more or less complete, of twelve hundred individuals, of criminal tendencies, all the descendants of one abandoned woman who has generally been known as 'Margaret the mother of criminals.' Hardly a single member of this family led an upright, honest life. Their whole environment favored immorality; and their native place, in the interior of New York State, might be characterized as a nest of crime. Tracing the history of this large family down for seventy-five years, Mr. Dugdale finds that, in crimes and misdemeanors of every kind it has cost the State of New York, in one way and another, over a million dollars. From father to son is almost one unbroken line of crime, perpetuated and intensified by environment and close

\*Encyclopedia Britannica, 9 ed., art. *Cretinism*. Chamber's Edinburgh Jour., May, 1848, pp. 296-99.

†Ribot. Loc. cit., Part I., cap. VI.

intermarriage, or rather by illicit relations of near kindred; for scarcely a legal marriage was known.\* Thus bad blood produced bad blood. Not one had strong enough will to overcome the environment, and acquired heredity, which in time became fixed and congenital, with no hope of improvement.

Space is left us for the consideration of only one other instance of depraved heredity, namely, pauperism, and its near relative, vagabondism. It is but recently that the subject has been viewed in the light of inheritance by transmission. But when we find two, three, and even four generations of paupers the inmates at one and (except in the case of the latter) the same time of a poor-house or work-house, and born and bred there, we cannot be blind to the operation of a law, or principle, governing the lives of such persons, and rendering it impossible for them to overcome hereditary character.

The pleasures of a vagabond life, so to speak, especially when some benevolent institution throws open its doors to vagabonds, where they may end the last few years of their lives in comparative comfort, are too great a temptation to those whose intellect is weak, and energies incapable of engaging successfully in the struggle for existence. Having asylums ready for their reception when they wish to seek them, the tendency to pauperism and vagabondism is increased rather than diminished. So long as a comfortable home is assured, little or no work required, so long will there be paupers and vagabonds to fill them. An asylum is a paradise to those to whom 'the world owes a living.' The worthy, exceptional poor, are thus driven effectually from those very institutions which were built for them alone, so that this class is seldom or never reached. Foundling asylums come under the same discredit. They seem to encourage immorality rather than limit the number of illegitimate and abandoned children.

Reports of charitable institutions show that these views are but too well founded. Thus there were 707,375 paupers in England and Wales, according to a report for July 1, 1876, at a cost to the government of over seven and a third million pounds sterling. There were over 40,000 pauper children which attended work-house and pauper schools. Of these, 15,568 lived in the work-house, subjected to all the bad influences of such training; 8,000 others attended district schools, or were boarded out in cottage homes. Only one-fifth, therefore, of the whole number of children enjoyed a pure atmosphere, and untainted by poor-house associations. Those who have studied this subject, and are best fitted to judge, consider that the pauper taint, when once imbibed, is never completely eradicated; that those brought up in the work-houses lose after a while all horror of the place, and are "always lamentably deficient in that spirit of inde-

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\*Dugdale. *The Jukes*.

pendence which is the greatest stimulus to exertion, and that nothing more degrades the character, in every way, than the pauper sentiment and temperament which the work-house induces."

In Scotland pauperism has been somewhat checked by what is known as the boarding-out plan. The expense has decreased from £2 to £4 *per capita*, with only five per cent. of failures, or relapses.

In France, under the village plan, there were only four per cent. of relapses to the previous 49 per cent. The paupers were boys who had committed crimes. Under this system (1877) 4,500 boys were educated. Of these, 850 were children of criminals; 1,400 illegitimate; 580 children of second marriages, and 850 orphans. Half of them followed the honest calling of agriculturists; one fourth became mechanics; and the remainder (less those who relapsed, four per cent.) entered the army and navy.\*

Germany has also become alive to the necessity of adopting some effectual remedy to prevent pauperism, and is still struggling with the problem.

Coming to our own country, we find a like deplorable state of affairs. Professor Dwight is said to have remarked, "One of the most terrible diseases which can affect a country has begun to break out in the rural districts, through the influence of the poor-house," alluding to hereditary pauperism. In the report of the Secretary of the State of New York Charities, it was said, that in the western part of that State were found *four generations* of paupers, all women of an immoral character, and *confirmed* paupers.

At the Dexter Asylum, Providence, R. I., is still to be seen the only surviving member of a family of three generations of paupers. They were among the first inmates of that institution, and were removed thither from the old work-house on August 11, 1828. Sybil Pitts, the grandmother, was 60 years of age at the time, was of immoral character, never legally married, and died there seven years later. Sally, the daughter, was a woman of weak intellect, immoral, never legally married, and died in 1864, at the age of 72. Benjamin, the son of the latter, was admitted when he was but 16, was never married, is an imbecile, and has now reached his 70th year. This family, so far as known, were always paupers, and always members of the work-house. The last named individual has already passed at least fifty-four (54) years of his life at public institutions. Other cases are given in Mr. Hazard's book, where individuals have been born (in Rhode Island) in a work-house, and lived there as long as sixty-eight (68) years. Generally such persons are children of intemperate, immoral or weak-minded parents, or intemperate and of unsound mind themselves.

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\* *Contem. Rev.*, Vol. XXI., pp. 132 et seq. *Hereditary Pauperism, etc.*

One other instance at the Dexter Asylum deserves mention. Here but two generations are represented, both on the female side. The mother is married legally, but epileptic; the daughter is sixteen, healthy, but not of strong mind, and cannot be trusted away from the asylum.

The foundlings brought to this institution are about nine out of ten of the *illegitimate class*.\*

#### APPLICATION OF THE LAW.

Now how are we to develop predispositions, improve the race by means of this law of acquired heredity? And how, again, shall we be able to remedy the bad effects in psychological and physical habits? How are we to eradicate all inherited taint, in training children of mentally, morally, or physically diseased ancestors?

Acquired heredity depends upon a principle, or force, known as the 'Law of Adaptation'—the influence of the surrounding circumstances upon the individual—adaptation to the environment. This law must never be lost sight of when considering the subject of education; and he who applies this law in its fullest understanding must always be regarded as the best educator. Thus ever exercising its influence upon the individual in many directions, education must after a time fix and make permanent certain qualities, tendencies, or predispositions, which are inheritable. This, of course, develops the race. Transmission by inheritance will then become congenital, the desired object in education. If this training be of the proper kind, the congenital heredity will take the proper direction.

Now congenital heredity preserves the normal type of the race, or of the individual. It is a much stronger force than the acquired form of heredity, as it should be, else every monstrosity and malformation would be lamentably and irremediably perpetuated. There is thus a constant struggle between these two forces; and it is only by constant repetitions of training, a persistent effort in one direction, that at last the acquired tendency wins the day, becomes congenital, at the same time not preventing the normal type from declaring itself.

Hence it may be seen, that acquired heredity is a *radical* force, while the congenital form of it is *conservative*. Did the former be suffered to have complete control over the organism, there would be no end to monstrosities and novel productions; the normal type would disappear, in short be its own destroyer. Experiments in crossing, and close inter-breeding of plants and animals show this.

On the other hand, did congenital heredity be allowed to have full control, the race would remain stationary. There would be no prog-

\*For further information on this subject see Mr. Hazard's *Reports* (1881) on the *Poor and Inmate of Rhode Island*.

ress, and the race would be where it started—a race of savages or semi-apes. It is therefore by a just balance of these two allied forces, through the law of adaptation, that the progress of the race is assured.

Now what form of education seems best adapted to the attainment of this end? What tends especially to the creation of tendencies to improvement, or the development of race? I answer, *prenatal* education, or the influences exerted over the unborn child by the mother during gestation.

The subject of *prenatal education* was first broached by Mr. A. De Frarière, in 1862, in a work entitled *Education Anterieure*, comprising the “Maternal influences during gestation, over the intellectual and moral character of the child.” As this title refers to education *anterior* to birth, I have ventured to use the term *prenatal* in preference to *anterior*, as being more comprehensive.

It is admitted on all sides that the mind influences the body through the system of nerves known as the Sympathetic. Fear, anger, emotions of every kind, leave their impress upon the individual in some form. Fear has been known to pervert the secretions, produce intestinal derangement, and blanch the hair. Fear, also, and the power of the imagination, have occasioned death; the remembrance of a disgusting or loathsome object has been so strong as to cause nausea and even vomiting. Fear has sometimes cured as well as caused disease.

The influence of the maternal mind over the unborn child may, perhaps, be better understood if we first briefly discuss the alteration of the secretion of the milk through emotional disturbances in the nurse, or the mother. Thus a mother, or a nurse, if suffering under some overwhelming emotion, may be the innocent cause of the death of the child.\* Boerhaave has mentioned the case of an angry nurse as the cause of epilepsy in a child she suckled; Brachet of a child thrown in convulsions on taking the milk of a nurse hardly recovered from a fit of anger against another woman. Bonchut declares that, when a mother labors under any violent emotion, the infant she nurses becomes agitated, ill at ease, and may have convulsions.† Any great excitement in the mother or the nurse, may so change the composition of the milk as to make it more or less pernicious to the child.

1. The maternal influence begins with conception, and extends through gestation and the period, known as lactation, which we have just considered. The unborn child is influenced more or less by what influences the mother, through the sympathetic nerves above mentioned; and this fact will be the more appreciated, when it is consid-

\**The Influence of the Maternal Mind over the Offspring during Pregnancy and Lactation.* Journ. of Psychology, Med. Vol. 2, pp. 1 et seq. Carpenter's *Physiology*, arts. Secretion and Generation.

†Journal of Psychology, Med., loc. cit.

ered the child is part of the mother herself, supported and influenced by her. Whatever disturbs the mother, must, in some degree, affect the child. Thus if fathers bequeath to their offspring a taste for drink, or crime, what must be the influence of an intemperate mother over her offspring in the most intimate relations as it is with her? Thus women addicted to intemperate habits may, by means of her circulation, destroy their offspring whose system cannot withstand the alcoholic poison; or she may bear a child of feeble mind and body, or never a living one.

Disease may be acquired also by the foetus during gestation, through the mother, as in the case of small pox. The child may take this disease while the mother escape, though she may have been previously vaccinated; or the child may die of the disease before birth, while the mother entirely escapes. Syphilis, when contracted in whatever way, just previous to, or during gestation, may be transmitted to the offspring, affecting it permanently, or causing its death; or what is worse, rendering the bearing of living children utterly hopeless.\*

Women exposed to lead poisoning are liable to miscarry. "Out of 123 pregnancies recorded, there were 64 miscarriages, 4 premature labors, 5 still-born children, 20 which died within the first year, 8 in the second, 7 in the third, and one at a later period; 14 living, of whom 10 only were more than three years old."†

2. The influence of the maternal mind over the unborn child offers us a deeper and more difficult problem; and M. De Frarière sees in it a fruitful source of improving the race, shaping the intellectual and moral character of offspring, and creating in them, anterior to birth, tendencies, impulses, or predispositions (as he calls them) for excelling in special lines of business or professions.

The doctrine of prenatal education has had more or less able advocates from ancient times down. The cunning Jacob is thought to have had some knowledge of this subject when he outwitted Laban, his father-in-law, and bred herds of such markings that the majority of them fell to his lot. Some such influence as this has been thought to be at work upon the foetus, when the mother, during the earlier months of gestation, is affected by certain external impressions or disturbances. Many absurd stories, therefore, have received currency, at one time and another, on the authority of such doctrine, such as marks of fruits, etc., known as "mother's marks," occasioned by shocks, emotions and ungratified longings in the mother. But, says Dr. Carpenter, "No soundly judging physiologist of the present day is likely to fall into the popular error of supposing that marks upon

\*Cazeaux, *Midwifery*, 5th Am. ed., p. 447.

†Loc. cit., p. 458.

the infant are to be referred to some transient though strong impression upon the imagination of the mother ; but there appears to be a sufficient number of facts on record to prove that *habitual* mental conditions on the part of the mother *may* have influence enough at an early period of gestation to produce evident bodily deformity, or peculiar tendencies of the mind.”\*

Other authorities are fully alive to the importance of a correct understanding of this mysterious influence, and give examples more or less conclusive.†

Our subject may be further illustrated from the inferior animals. The mother may be so impressed with the attributes of the father as to transmit them to her offspring, as in the following instance : A mare had a foal by a quagga, and, then, subsequently gave birth to four colts, each of which was marked along the spine with a stripe like that of the quagga. We often see litters of rabbits, dogs, and sows with markings like those of previous litters with different fathers ; and it is not uncommon to see the children of a woman (widow) by a second husband, resemble in body and mind her first husband ; provided, of course, she has had children by her former husband. Breeders of stock are also aware of this fact, and never let blood animals run with males of an inferior stock. So strong, in fine, is this influence of the father upon the mother through his children, that the wife often comes to resemble her husband in mental and physical characteristics.‡

This maternal influence not only affects the bodily configuration of the child, but its mentality. Dr. Seguin has given cases where there was reason to believe that idiocy in the child has been due to a fright, anxiety, or any emotion in the mother.§

It remains now to consider how this sensitive organization of the child may be influenced in more or less special lines, through prenatal education, to the improvement of the race, and the happiness and further development of the individual.

M. De Frarière seems to be an enthusiast on this subject. He gives every prominence to anterior education, and would give a thorough course of special training to the enciente mother, in that direction according to the *predisposition* desired to be produced in the offspring. He cites music as an acknowledged created predisposition, and as an example makes mention of a youthful prodigy astonishing the musical world with his marvellous talents (1862) ; and this gift of music was acquired (sic) by giving his mother a thorough course of musical instruction during her gestation.||

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\*Carpenter's Loc. cit. Article *Generation*.

†Journal of Psychological Medicine, etc., vol. 2, p 1 et seq.

‡Loc. cit., p. 21.

§Loc. cit., p. 23.

||Loc. cit., vol. 2, p. 323 et seq.



Though much of the theory of De Fratriere smacks of the visionary and impractical character of French theorists, yet he undoubtedly proves that the character of the child is affected by the mental and physical training of the enciente mother; and though we may not hope to manufacture musicians, scientists, and geniuses generally, to order, we may yet be able to remedy defects in the race, improve existing faculties, create a tendency to improvement, or, as he would say, a *predisposition*.

Our author strengthens his theory by taking examples of breeding among the lower animals. The Arabs, he remarks, entertain the firm belief that the mare influences her foal. She is therefore well cared for during gestation; for they think that *race* will not be sufficient of *itself* to endow a foal with those qualities of speed so highly prized. Dogs and cats also produce offspring of a gentle disposition if not irritated in pregnancy.\*

The ancient Mexicans seemed to be aware of the same fact. During her gestation the woman was required to observe many rules to insure the safety and perfect development of her future offspring. Hard and continued labor, lifting of weights, running, and all mental excitement, such as fear, anger, grief, and the like, were particularly to be avoided. But like the more civilized nations of the Eastern Hemisphere, the Aztecs gratified, with but one exception, every caprice of the pregnant woman, for fear that the least disregard of her whims might be attended, in respect to the child, with the most unhappy results. Many of these precepts, however, were of a superstitious nature, but not more so than are found among all peoples in early and rude civilizations.†

Among the ancients, the Greeks more especially felt the importance of a perfect knowledge of this principle. They trained their youth of both sexes with the avowed purpose of making healthy men and healthy women, and rearing a hardy race of warriors. As the story goes, a Lacedemonian woman being told that the Spartan women ruled the men, very truly replied, "We are the only women who bring forth men." And this simple legend more than volumes shows the object of Spartan legislation. Inured to hardships alike with the men, and the severest discipline of the gymnasiums, which abounded in all Greece, the women surpassed all nations not only in physical beauty, but in the treasures of the mind. And so equally were mental and physical training balanced, that a sound mind could be said to exist in a sound body.

The object of all this training, then, being the production of a strong, healthy, vigorous race, the education of the young Greek

\*Loc. cit.

†Bancroft's *Native Races*, etc., vol. ii., p. 267.

began before birth. To this end women during gestation were subjected to moderate exercise, required to undergo a course of hygienics, allowed no wine unless diluted with water, while their diet was regulated by the physicians. In fine, they must lead a tranquil life. Lysurgus somewhat modified these rules by requiring of the women a severer form of exercise, so as to benefit both mother and child,\* and also, undoubtedly, for the special purpose of rendering childbirth less painful.

From the foregoing facts we can not fail to see that the Greeks perfectly understood the importance of physical and mental culture, not only in benefiting the mother, but, to some extent, in moulding the character of the child—the necessity of treating the mother with more kindness and indulgence at that period of her trial, when leniency is particularly grateful to her, and tends so much to the proper development of her offspring. For children conceived in sorrow, misery, poverty, and a host of other untoward circumstances which might be in the majority of cases greatly modified or obviated, inherit all the bad qualities of ancestors, with few if any redeeming characteristics. Such an environment seems to revive latent characters, the survivals of savagism.

A preparative, so to speak, to prenatal education, is the proper education of the parents. As the male influence, as well as the female's, affects the offspring (in transmitting qualities unpossessed by the female line), so the education of both parents is important if we expect to secure satisfactory results. The Greeks saw this clearly, perhaps more clearly than any other people, and used it for their purpose. If we, then, model the education of our youth after Spartan methods, we at least secure healthy men and healthy women at the outset, and not feeble bodied, weak minded individuals whom no law forbids to propagate paupers, criminals, and imbeciles. We first want good material to begin on.

Among those practices particularly to be avoided in attaining this end are :

1. *Intermarriage of the Diseased.* This refers to any who may be diseased mentally, physically, or morally—one, or both the parties contracting marriage. Whether the disease be latent in the system, or already has appeared in one or both parties, the fruit of such marriage will as surely partake more or less of the defects in the parents, as a piece of charcoal will leave its impress upon the fingers. Children of drunken fathers, or mothers, or, worse still, with both parents of intemperate habits, are usually feeble minded, inherit a passion for

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\*Aristotle. *Politics*, IV. 17.

drink, or die early. Charles X. had an intemperate father, and died of general paralysis. Many diseases are found inheritable, even latent in one generation, and breaking out in a second; or else transmitted for several generations to the misery of the infected. Truly the sins of the fathers are visited upon the children of the third and the fourth generation.

2. *Improper Marriages.* These comprise the marriage between persons too young, or too old, or where there is great disparity in age. The character of modern society makes such unions too common, especially as few men among the better classes can acquire sufficient means to marry until late in life. The old and the young were never intended to be mated. Some enter the married state almost as soon as they catch a glimpse of the world, united to some aged millionaire. Neither is it desirable for babes and sucklings, hardly out of the cradle, to marry; nor those with but a few years between them and the grave, unless a first marriage, and only then with a woman of a suitable age. Sparta had laws against such unions. A young man and a young woman were obliged to marry before a certain time under the penalty of losing special privileges. He who did not marry till advanced in years was looked upon as little short of a criminal. It is needless to say that the offspring of all these improper unions possess qualities incapable of meeting successfully the struggle for existence.\*

3. *Ill-Assorted Marriages.* Men of intellectual ability should stamp the character of the race. But unfortunately the contracting parties are not always equal in mental and physical culture. A passing fancy, or the dictates of society, generally overturns all laws with regard to health and proper marriages. Many a fine intellect has been dwarfed by an ill-assorted marriage, and the children have generally inherited the worst qualities. But probably people will continue to marry to suit themselves, for money, or otherwise; and it is wonderful the race is even so well preserved. Such marriages are ill-advised, and generally prove a fertile source of unhappiness.†

4. *Intermarriage of near Relatives.* Concerning consanguineous marriages much has been said, and as much more might be as readily written without exhausting one tithe of this interminable question.

With rare exceptions the history of the past speaks against such marriages. The laws of Manu, Moses, and of the Romans, the decrees of the Christian Councils, and the Koran are against them. Some savage people were in favor of them; and others not.

Scientists, including Darwin, observing the bad effects of close inter-breeding among the lower animals, would discourage the mar-

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\*Walker's *Intermarriage*, part VII., pp. 334-5.

†Loc. cit., p. 163.

riage of near relatives. In animals such inter-breeding is followed, with but few exceptions, by loss of vigor and fertility. The exceptions, however, do but prove the rule.\*

Many attribute to such unions all the ills humanity suffers from, such as idiocy, deaf-mutism, epilepsy, mental and physical decay. To prove this last Ribot cites the families of the *Largidae* and *Seleucidæ*. The first family dates from the reign of Ptolemy Soter to Cleopatra and Cæsarion, covering a period of nearly 300 years, and producing sixteen sovereigns. The other family reigned for nearly 250 years, and possessed twenty sovereigns. Both were in a state of decay. Sisters often married brothers; nieces, uncles; and aunts, nephews. Both families also intermarried, thus perpetuating all the *acquired diseases and evil habits of past generations*. The two families finally became extinct.†

On the other hand, Quatrefage has observed that, when both parents are healthy, consanguinity will have a tendency to perpetuate such health, rather than result disastrously to the family thus marrying. But, as this establishment of perfect equilibrium of the health of the parents is easily disturbed, he regards such marriages as injurious in proportion as the morbid predispositions, common to both, are more marked. Ribot, quoting the above at large, would not advocate them, on account of their usual results; though they are not necessarily hurtful in themselves‡

The ill effects of the intermarriage of near relatives may be again seen in the history of the aristocratic classes, the old nobility, and others, where caste, policy, diplomacy, money considerations, and various family reasons, tend to perpetuate such unions. Different from most monarchical countries, England is an exception to the general tendency. Here the nobility never remains stationary, being recruited from time to time from the mass of the population. Men knighted for services rendered the State, or ennobled for great merit, renovate the decaying energies of the aristocracy, not only bringing into it better blood, but constituting it one of the ablest and most vigorous classes of people in existence. Money, here, for once is of service, being an inducement for alliances with noble families, either on the male or the female side.§

Similar bad results are still further noticed in islands or in small communities remote from public travel. After several generations the evil effects of consanguineous marriages are apparent in physical and mental infirmities, loss of character and energy, and in an increase of scrofula and consumption. No improvement is seen in the people.

\*Darwin's *Animals and Plants, etc.*, vol. ii., c. xviii.

†Ribot, *Loc. cit.*, pp. 290-292.

‡*Loc. cit.*, p. 292.

§Vld. Smiles' *Self Help*. Walker's *Intermarriage*, part iv., pp. 71 et seq; part vii., pp. 312 et seq.

Sooner or later decay of body and of mind is manifest. Certain inhabitants of the valleys of Switzerland show this clearly. Impassable mountains encompass them on every side, shutting them out from intercourse with the outer world. And there have they lived for hundreds of years, and closely intermarried. "Here we find goitre, cretinism, scrofula, albinism, mutism, and idiocy, in all their most aggravated forms."\*

To the same cause, especially, has *sterility* been attributed. In 123 cases of consanguineous marriages, given by Dr. Allen, only 99 were fertile.† But their bad effects are no better proved than by the disappearance of all mental and physical defects when marriages take place between more remote relatives.

Even the intermarriage of first cousins is not unattended with risk. In a report of 580 cases of such unions, resulting in 2,778 children, "793 of the children were defective; 117 deaf and dumb; 63 blind; 231 idiotic; 24 insane; 44 epileptic; 189 scrofulous; 53 deformed; and 637 died early.‡

"But inasmuch," says Dr. Allen, "as there is in cousins, according to the best statistics gathered, so much of a family resemblance or likeness, and so much imperfection of structure or morbidness of function or eccentricity of character is found to accompany it, that the hereditary effects are decidedly prejudicial to offspring, we are warranted in laying it down as a general rule, *that cousins should not intermarry*. This rule is the more imperative when it is considered that the evil effects accumulate with wonderful power in every successive generations, and that there is no absolute necessity for the formation of such marriages. As *free moral agents and accountable beings, then, we have no right to inflict upon the innocent such an untold amount of misery and suffering.*"§

The question concerning the future of hybrid peoples, formed by the union of superior with inferior races, is still unsettled, but, at least, so far as our experience goes, the tendency is bad. The prospect looks dark even for the inferior race.

Such, then, are some of the most salient points well to be considered in attempting the material improvement of the race. Whether prenatal education is destined to secure all the wonderful results which the enthusiastic De Frarière would claim for it, is a question which is not possible to be answered in the present infancy of the subject. But it is

\*Journ. of Psychological Medicine, vol. III., pp. 347 et seq.

†Loc. cit., pp. 356 et seq.

‡Loc. cit., p. 356 et seq.

§Loc. cit. p. 398. Also on the subject of Marriage, Inter-breeding, and the Transmission of Disease for further reference, see Darwin's *Origin of Species*, and *Descent of Man*, Wallace's *Natural Selection*, Maudsley's *Physiology and Pathology of the Mind*, and Carpenter's *Mental Physiology*, article *Hereditary Transmission*.

undoubtedly true from the authentic cases recorded, where many untoward results have followed, inattention to such matters; where shocks, and mental disturbances of all kinds which would produce no bad effects upon the mother, might, however, be the cause of death of the child, or, what is a hundred times worse, idiocy, or deformity, that careful attention to the mother's environment during gestation is attended by the best results.

From such cases of a negative type, we are the more fitted to judge in some degree of the importance of obeying the laws of nature, and using to the advantage of the race the two forms of heredity, *acquired* and *congenital*. What is true in respect to the lower forms of life, is likewise true in regard to man.

It is clearly evident, therefore, that it should be our constant endeavor to ameliorate as far as possible the condition of the mother during her trying period, and to surround her with those influences which, though not at once producing in her child qualities unpossessed by ancestors, may at least place her in the best possible condition for creating in her offspring tendencies to improvement, which further education, after birth, may develop in the desired direction.

To sum up the general arguments employed in the foregoing pages, we arrive at the following conclusions:

That the improvement of the race depends upon the character of the *environment*.

That external circumstances react upon the individual through what is known as *heredity*, or transmission of qualities by inheritance.

That heredity is a law everywhere in operation, and shows itself under two forms, namely, *congenital* and *acquired*; the first fixing the character of the individual, and afterward the whole race—preserving and perpetuating the normal type of each individual and the nation; the other producing new varieties, or types, dependent upon the environment, but modified by congenital heredity.

That morbid heredity is obviated by the congenital, and assisted by the acquired form, if operating in the right direction.

That the persistent action of acquired heredity finally gives rise to the congenital form of inheritance; that is, makes the acquired character perpetual.

That in this way education, or the proper application of the environment, tends to racial development.\*

That education may be of two kinds, namely, before birth (prenatal), and after birth.

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\*The term *Education* must not be confounded with the word *Instruction*; it rather signifies to draw out, to develop, not to put in.

That maternal influences exercise control over the unborn child from their close relation with heredity.

That a perfect understanding of the laws of heredity leads to the proper kind of prenatal education to be adopted.

That previous education of both parents, especially of the mother, makes the prenatal education more easily moulded to hereditary tendencies.

That a careful attention to mother during gestation is followed by the most happy results.

That the creation of tendencies, or predispositions, is all that in the present state of science can be expected.

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HOUSE DRAINAGE  
AND  
SANITARY PLUMBING.

BY

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## HOUSE DRAINAGE AND SANITARY PLUMBING.

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Many erroneous ideas still prevail about sewer gas and its danger to health which arises, by having so-called "modern conveniences" in our dwellings. It is the purpose of this paper, without in any way adding to the "plumbing scare", clearly to define wherein the danger consists, but at the same time to establish rules for the proper drainage and plumbing of houses, which, if carefully observed, will secure to the anxious house owner, work of superior quality and of a positively safe character.

Plumbing fixtures, which were considered a luxury years ago, are now believed to be necessary, not only for comfort and convenience, but also, and even more so, for health and for cleanliness. Even a small house is nowadays generally provided with a kitchen sink, a water-closet, and sometimes a bath-tub, while in a costly modern residence, arranged with an elaborate system of plumbing, we find kitchen, pantry and scullery sinks, slop sinks, laundry tubs, stationary wash-basins in closets near bed-rooms, a great number of bath or dressing rooms, with water-closets, urinals, bath- and foot-tubs, bidets and other fixtures.

The suggestions and recommendations of this report apply with equal force to the drainage and plumbing of tenements, small houses, costly residences, villas, apartment houses, hotels, factories, school-houses or public buildings. As every plumbing fixture is not only an outlet for the waste-water to the drain, but possibly may become an inlet for drain air, the danger increases with the number of fixtures. It is, therefore, of the utmost importance to arrange the plumbing and drainage of a building so as entirely to exclude any possibility of the escape of sewer gas into it.

I shall, first, briefly consider what is meant by the term "sewer gas." This term, as Prof. W. Ripley Nichols has truly said,\* is "an unfortunate one, and gives rise to a quite widespread but very erroneous idea. Many seem to suppose the "sewer gas" to be a distinct gaseous substance, which is possessed of marked distinguishing characteristics, which fills the ordinary sewers and connecting drains, and which, as a tangible something, finds its way through any opening made by chance or by intention, and then, and only then, mixes with the atmospheric air."

Sewer gas is a mechanical mixture of a number of well-known gases, having their origin in the decomposition of animal or vegetable matter, with atmospheric air. This mixture is continually varying, according to the more or less advanced stage of putrefaction of the foul matters, which form a sediment and a slimy coating of the inner surfaces in drains and pipes. It is also variable with the character of this sediment or deposit, and with the physical conditions (moisture, heat, etc.) under which the decomposition takes place.

The principal gases found in sewers and drains are oxygen, nitrogen, carbonic dioxide, carbonic oxide, ammonia, carbonate of ammonia, sulphide of ammonium, sulphuretted hydrogen and marsh gas.

The three first named gases are the principal constituents of the atmosphere, surrounding the globe, and are found present in the following *average* proportion, viz.:

20.9 vols. oxygen	} in 100 vols. of air, together with
79.1 vols. nitrogen	
2 to 5 vols. carbonic dioxide in 10,000 vols of air.	

According to R. Angus Smith the amount of *oxygen* is:

- in the average, 20.96 vols. in 100 vols. of air.
- in pure mountain air, 20.98 vols. in 100 vols. of air.
- at the sea shore, 20.999 vols. in 100 vols. of air.
- in streets of populous cities, 20.87 to 20.90 vols. in 100 vols. of air.

The air in sewers and drains contains much less oxygen, as some of it combines with the carbon of putrefying organic matter forming carbonic dioxide. The amount of nitrogen in the air of sewers is little different from that in the atmosphere which we breathe; but the amount of carbonic dioxide present is greatly increased.

The lowest amount of oxygen in sewer air is recorded to be 17.4 vols. in 100 vols. of air; the amount of carbonic dioxide is in the *average* 2.3 vols. in 100 vols. Sulphuretted hydrogen varies greatly, but the quantity is generally so small as not to be easily determined. Still more difficult is it to find by chemical analysis the proportion of other gases of decay.

\*See Prof. W. Ripley Nichols' report upon chemical examination of the air of the Berkeley street in Boston, Mass., 1878.

In well ventilated and well flushed sewers, Dr. Russell, of Glasgow, found the following ratio:

20.70 vols. of oxygen in 100 vols. of air.  
 78.79 vols. of nitrogen in 100 vols. of air.  
 0.51 vols. of carbonic dioxide in 100 vols. of air.  
 No sulphuretted hydrogen in 100 vols. of air.  
 Traces of ammonia in 100 vols. of air.

Carbonic oxide is present only in excessively minute quantities, and even then it may have entered the sewer or drain through leakage of illuminating gas from gas mains.

In the absence of more satisfactory methods of analysis, it is usual with chemists to determine the amount of pollution of the air, or the organic matter in it, by determining the amount of carbonic dioxide present, assuming that there is a certain fixed proportion between the amount of carbonic dioxide and the organic matter.\* Thus, Prof. W. Ripley Nichols records as the average of many carefully conducted experiments in Boston, the amount of carbonic dioxide in a sewer in that city as follows:

#### The average of

31	determinations in January, 1878, was	8.7 vols. of CO <sub>2</sub> in 10,000 vols. of air.
44	" " February, 1878, was	8.2 " " " "
47	" " March, 1878, was	11.5 " " " "
12	" " April, 1878, was	10.7 " " " "
8	" " June, 1878, was	27.5 " " " "
8	" " July, 1878, was	21.9 " " " "
6	" " August, 1878, was	23.9 " " " "
7	" " January, 1879, was	8.0 " " " "
14	" " February, 1879, was	11.6 " " " "
20	" " March, 1879, was	11.8 " " " "

He remarks: "It appears from these examinations that in such a sewer as the one in Berkeley street, which, being of necessity tide-locked, is an example of the worst type of construction, the air does not differ from the normal standard as much as many, no doubt, suppose. In a general way, as we have seen, there is a larger amount of variation from normal air during the warmer season of the year; but even when the amount of carbonic acid was largest, it was only extremely seldom that sulphuretted hydrogen could be detected." . . . "I think it should be said that the soil-pipes and house-drains are much more likely causes of discomfort and danger than the sewers."

\*Such is strictly true only for air fouled by respiration, while it may not give accurate results in other cases.

In regard to this interesting question I must refer to the Report of Prof. Ira Remsen on the subject of organic matter in the air, published in the National Board of Health Bulletin, vol. 2, No 11.

Hence the importance of a thorough ventilation of all the soil-, waste- and drain-pipes in a building.

The question here naturally arises: Are the above found constituents of sewer air the origin or cause of the sickness so commonly attributed to the inhaling of sewer gas? The answer is that, although many of the above gases are poisonous, if inhaled into the system in large quantities, and may, even if present in smaller quantity, cause nausea, asphyxia, headache, vomiting, etc., none of them can be said to *produce* any of the so-called "filth-diseases." To determine the exact origin of these is a still unsolved problem of physiology. While some believe that the particles of decomposing organic matter, present in sewer air and known as "organic vapor" cause disease, others seek the origin of the latter in microscopic *spores* or *germs* which live and feed upon such organic vapor and are capable of reproduction under favorable conditions, such as presence of putrefying filth, excess of moisture, heat, lack of oxygen, etc.

Whatever theory may be accepted as true, it is evident that, by preventing the decay of organic matter within sewers, drains and soil-pipes, and by depriving these germs (if such be the cause of disease) of the conditions facilitating their reproduction, we can best prevent the outbreak of excremental diseases. In other words, *by completely removing as speedily as possible all waste matters from the dwelling by pipes thoroughly and tightly jointed, and by a sufficient dilution of the air in these pipes with oxygen, the danger of infection, arising from defective drainage and plumbing, may be reduced to a minimum.*

The unhealthiness of dwelling houses has been greatly increased by cheap and therefore careless plumbing, through ignorance or intention of builders. The consequence was a growing inclination with some to abandon all plumbing fixtures, to go back to the ill-famed privy in the backyard, and to follow the practice of throwing the slops from the kitchen upon the grounds in the rear yard.

But, cannot with careful, conscientious and honest workmanship, carried out under the strict supervision of an expert, this risk be avoided? Is it such a difficult thing to have a proper and judicious arrangement of the drainage system?

I shall endeavor in the following pages to explain what the essential elements of a well-devised system of house drainage and sanitary plumbing are. Much has been written of late about this subject. It has been well and thoroughly treated by able writers and my paper can hardly claim much originality or novelty, but should be taken as the outgrowth of much study and experience.

The essentials of a perfect system of house drainage are simple and can be readily understood by any householder, when carefully ex-

plained. They involve nothing more than the proper application of well-known laws of nature. I hope to succeed in convincing the reader that there is no mystery, no secrecy about any part of the work. Any one building a house is able to secure the essential elements of good drainage and plumbing without having to resort to any patented system. The proper way of laying and trapping drains, of ventilating soil- and waste-pipes, etc., cannot, in my judgment, be patented. The plumbing fixtures are, of course, mostly patented, as any useful appliance may be, and in speaking of these one cannot avoid recommending some patented device.

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I shall assume that the entire sewage of the dwelling delivers either into a regular system of sewers, or else discharges into an open water course; or—in the absence of either—runs into a cesspool, be it a leaching cesspool, or a well-cemented, tight vault of brickwork; or finally, into a flushtank, to be disposed of on the grounds by surface irrigation, or below the ground by the subsurface irrigation system.

So far as the arrangement of the *inside* plumbing work is concerned, it does not make any material difference, which of the above systems of getting rid of the waste-water from habitations, is available.\*

Under all circumstances the three cardinal objects to be fulfilled by a perfect system of house drainage are:

1. To remove from the inside of the dwelling as quickly as possible all liquid and semi-liquid wastes, whether it be the soapy discharge from wash bowls, bath tubs and laundry tubs, or the vegetable refuse from the scullery sink, the greasy matter from kitchen and pantry sinks, or the foul discharges from slopsinks, urinals and waterclosets.

2. To prevent the foul gases, originating from the decomposition of the above matters in the drain, sewer, cesspool or flushtank, from returning through the same channels into our dwellings.

3. To oxidize and render innocuous by a copious flushing with air the foul gases due to the possible putrefaction of waste matters within the house drains, soil- and waste-pipes, at the same time properly protecting all outlets of fixtures from the entrance of these gases.

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\* It is not intended in this paper to discuss the merits and faults of these different methods of sewage disposal.

The subjects to be considered are:

1. The drains outside of the house.
  2. The drains inside of the house.
  3. The soil- and waste-pipes.
  4. The ventilation of drains and pipes.
  5. The trapping of the main drain.
  6. The trapping of all wastes under fixtures.
  7. The various plumbing fixtures.
  8. The drainage of cellars.
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#### DRAINS OUTSIDE OF THE HOUSE.

The house drain is the means for conveying the sewage from the dwelling. Its proper material is a question of great importance. Outside of the dwelling it should be of vitrified pipe, circular in shape, which is superior to cement pipe.\* Neither brick channels nor wooden conduits should be used for this purpose. Only strong, hard, well-burnt, vitrified pipe, free from cracks or other defects should be used. Four inch pipes and those of smaller size are especially liable to warping, and should be carefully inspected and selected. The interior of these pipes should be well-glazed and smooth throughout; the pipes should be impervious, true in section, perfectly straight, and of a uniform thickness. Four inch pipes should have a thickness of  $\frac{1}{2}$  in. to  $\frac{3}{4}$  in.; six inch pipes  $\frac{1}{4}$  in. to  $\frac{3}{4}$  in.; nine inch pipes should be not less than  $\frac{3}{4}$  inches thick; twelve inch pipes should be 1 inch thick; 15 inch pipe  $1\frac{1}{4}$  in., and 18 inch pipe should have a thickness of  $1\frac{1}{2}$  inches.

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\*Iron pipe for outside drains is preferable in made ground, or in quicksand, also where trees are near the line of the drain, and where the drain must necessarily pass near a well furnishing the water for the household.

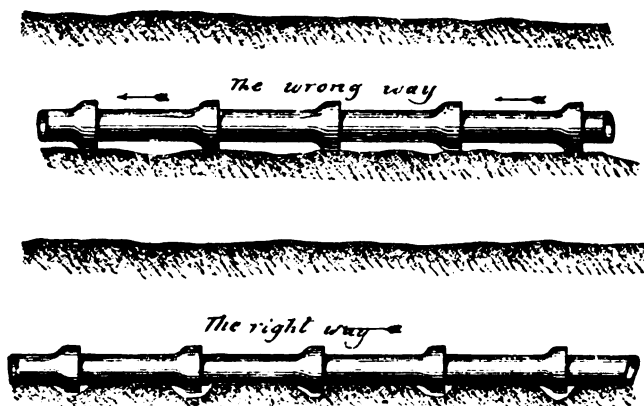


FIG. 1.

Care should be taken to lay the pipes on a firm bed of sand or gravel, and if this is not available, a concrete base should be provided in the trench. Special grooves should be cut for the sockets, in order to give the pipe a solid bearing on its entire length (see Fig. 1). All

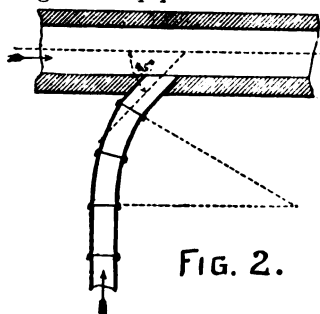


FIG. 2.

pipes should be laid in straight lines, all changes of direction should be effected by curves of as large a radius as possible, formed of bent pipes. All branches should join the main under an acute angle, by special Y pieces (see Fig. 3), for a right-angled junction (by a T branch, Fig 3a) tends to form eddies and consequently deposits in the main drain. If the drain discharges into a public sewer the connection should be made as shown in Fig. 2.

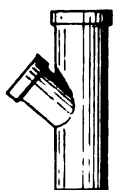


FIG. 3.

The joints of the pipes should receive particular attention. The danger arising from imperfect or leaky joints is twofold, namely, first, the sewage, by soaking into the ground, pollutes the soil and endangers the purity of the water supply in places where houses are dependent on wells and cisterns for water.



FIG. 3a.

The ground around and under the house is more and more subject to contamination, and in winter time, when there is a strong inward draft into houses from fireplaces and stoves, the tainted "ground air" is thus sucked into our very living and sleeping rooms, often producing severe illness. The second danger resulting from leaky joints is equally patent. The solid matters, carried in suspension in the pipes, are deprived of a part of their liquid carrier, and thus tend



to accumulate and form deposits in the house drain, which deposits soon undergo decomposition, and fill the drains and pipes with noxious gases.

In order to prevent the leakage of joints, the spigot and socket ends of pipes should be concentric. Into the annular space between spigot and socket introduce a small gasket of picked oakum, rammed into this space by a hand iron. Then fill the remainder of the space with hydraulic cement, or cement mixed with an equal volume of sand (never use any *lime* in the mixture). Particular attention should be paid to the bottom part of the joint, where the mortar should be pressed into it with the fingers. Finally wipe some cement in front of the socket. The workman should always have a rattan and a rag, with which to wipe the inside of the last joint, in order to clean the drain from projecting parts of cement or mortar, which would tend to cause deposits. Some object to the use of cement for drain pipe joints, claiming that the stiffness of the cement joint after hardening will tend to break the pipes in case of a slight settling. They also maintain that some cements increase considerably in volume when setting, and tend to burst the sockets. They much prefer a ring of puddled clay, pressed into the joint and wiped around it, claiming that clay will make a tight and more elastic joint. But in ordinary cases the settling of drain pipes may be prevented by providing a solid foundation of either gravel, sand or concrete, or in very wet ground, boards or piles as supports to the pipe. In made ground I should recommend the use of iron pipes to prevent leaky joints or breakage of pipes. A good Portland cement will not much increase in volume after setting, and I believe it has been shown that those cements which largely increase their volume, often lose their hardness after some time, and would be, therefore, unfit for any use. While I fully appreciate the advantage of a somewhat elastic joint, I do not think that puddled clay will make as tight a joint as seems desirable for drains carrying foul sewage.

What is known as "Stanford's Improved Pipe Joint" has been used extensively of late in works of house drainage in England, and its superior merits are such as to recommend it for use with us. I, therefore, introduce a brief description. "In sewer work in bad or wet ground, just where a sound joint is most required, the difficulty of making it is the greatest. What is wanted, therefore, is a joint that will entail the least disturbance of the ground, that will not necessitate the absolute drying of the trench bottom, and that will require the minimum of time, skill and labor in making it. These conditions will be fulfilled in the most complete manner by making the spigot of one pipe to fit mechanically into the socket of another, as in a bored and turned iron pipe joint. Such a mechanical fit cannot be

obtained with stoneware or earthenware pipes, owing to the difficulty of preserving perfect accuracy of form during the process of burning."

"In the Stanford joint tightness is obtained by casting upon the spigot and in the socket of each pipe, by means of moulds prepared for the purpose, rings of a cheap and durable material, which, when put together, fit mechanically into each other, and by making these rings of a spherical form, a certain amount of movement or settlement may take place without destroying the accuracy of the joint. In laying these pipes, therefore, all that is necessary is to insert the spigot of one fairly and firmly into the socket of another previously laid, and the joint is complete and perfectly water tight. A smearing of some kind of grease is frequently found to be of advantage."

Half-socket or access-pipes are sometimes useful, where it becomes necessary often to inspect the house drain. They should be located close to angles, bends, junction branches, running traps, etc. They are not much used in this country, owing, probably, to the fact that, should the main drain run over one-half full, sewage may leak out through the access-pipes into the soil.

In laying drains, care should be taken to avoid, as much as possible, trees. The roots of these are frequently found to penetrate and often choke the pipes, and are certainly a dangerous obstruction to the flow in the drain. If the line of the drain must necessarily pass near trees, the use of iron pipes is recommended. The coating of the pipes with coal tar on their outside, the use of asphaltum for joints, and sometimes the surrounding of the drain with a strong layer of concrete are said to be effectual protection against roots of trees.

I now must speak of the *grade of the drain*, as this is a matter of prime importance. Upon the inclination of a pipe depends the *velocity* of the water flowing through it. If this velocity should be insufficient, deposits will occur, and the drain will in time become choked. Pipes of 4 inches diameter should have a velocity of flow of from 3 to 4½ ft. per second; those of 6 and 9 inches diameter should have a velocity of not less than 2½ to 3 ft. A velocity of 2 ft. per second should be considered the minimum allowable in house drains. As a general rule the inclination of a house drain should be as great as attainable, and must be, wherever local conditions will permit, continuous. It is not unfrequently found by uncovering old drains that, in order to save digging, they are laid very flat—nay, often level—from the point where they leave the house to nearly their junction with the sewer, at which place they are turned with a steep pitch downwards, and often enter the sewer at its crown. By distributing the whole available fall over the total length of the drain a much better grade would have been secured.

In order to lay a drain with a true grade, especially where the fall is little, a level should be used. The elevation of bottom of pipe, where it leaves the house—at a depth of not less than 3 feet in the New England States, as a protection against frost—should be ascertained, as well as the elevation of the junction with the sewer (or else inlet to cesspool or flush tank). A profile of the ground along the line of the drain should also be determined by levelling. Thus, the proper available fall can be determined, with a little additional trouble, it is true, which, however, will be well repaid by securing a much better quality of the work.

A fall of from 1 in 40 to 1 in 60 is desirable for pipes of 4 or 6 inches diameter, but this cannot always be had. I would consider a grade of 1 in 100 as the least to be given to small house drains, in order to keep them self-cleansing. When laid with such fall and running full or half-full, a six-inch drain has a velocity of  $3\frac{1}{4}$  feet, a four-inch drain a velocity of nearly 3 feet, which is sufficient to carry along such suspended matters as only ought to enter a house drain. Where the available fall is less than 1 in 100, special flushing apparatus, such as Field's flush tank, McFarland's tilting tank, or Shone's hydraulic syphon ejector should be used. The former seems to many preferable, as it is free from all movable parts which are liable to get out of order, unless carefully and continually watched.

I have thus fully explained the right method of laying drain pipes, because, even with the best plumbing inside of the house, it is of the greatest importance to have the outside drains of good quality, properly laid, and properly jointed.

The next question to be considered is: *What is the proper size for house drains?*

This will, of course, depend to some extent upon the grade of the drain, the size of the house and number of its occupants, the amount of water used per head per day, and finally, unless the rain falling upon the roof is stored in a cistern, upon the amount of rain-fall to be carried off in a certain time. This rain is a most beneficial scourer for drains, and unless the sewage of the dwelling is to be disposed of by irrigation, or the sewers of the town built according to the "separate system," which excludes the rain-fall from the channels carrying sewage, I should strongly advise to deliver it into the same channel, which carries away the foul wastes of the habitation. Even with this double purpose in view the house drain need not be very large, and the closer its size is proportioned to the volume of water it must carry the more *self-cleansing* will it be. This is easily understood, for the same stream that fills a 4-inch drain half-full will spread out at the bottom of a 9-inch pipe, and, having less velocity, will be unable effectually to remove sediment [see Diagram II in Appendix I].

For an ordinary city dwelling a drain four inches in diameter is ample, even including all the rain-fall. For a larger lot and residence a six-inch drain is all that is needed, even if the fall should be only 1 in 100. As a general rule, house drains have been constructed of too large a diameter, and one often meets with the objection that a four inch pipe will clog up with grease in a short time, or will be obstructed by solid substances. To this, I answer, that in regard to grease the only safe way, where it is allowed to waste, or in case of large boarding-houses and hotels, is to keep it altogether out of the drain (which can be easily accomplished by a suitable grease trap). Grease congealing in a drain is sure to clog it, no matter how large it is made. The stoppage would be only a question of time, and nothing could be gained by postponing this inevitable result. In regard to obstructions by solid matters, I may assert that nothing which passes through the strainer of a sink or from the water-closet bowl can possibly obstruct the drain. What may enter through carelessness of servants or of the householder, such as "sand, shavings, sticks, coal, bones, garbage, bottles, spoons, knives, forks, apples, potatoes, hay, shirts, towels, stockings, floor-cloths, broken crockery, etc.," to quote from Mr. J. Herbert Shedd's Report on the Sewerage of Providence, cannot rightfully be expected to be carried away in a drain. To guard against such obstructions, the drain should be made accessible, especially near bends, junctions and the main trap.

Let us now consider the question of the proper size of drains by applying the well-known laws of hydraulics to it. The Diagram I, in Appendix I, showing discharge, velocity, size and inclination of drains or sewers, has been calculated from Weisbach's formula for discharge of pipes, supposed to run half full. Table No. 1, in the same Appendix, has been calculated by Robt. Moore, Esq., C. E., late Sewer Commissioner of St. Louis, from Weisbach's formula for flow of water through open culverts. It gives the size and velocity in house drains, laid at different inclinations, and for various sizes of lots, the rain-fall being 2 inches per hour, and the pipes running  $\frac{3}{4}$  full. Table No. 2 (ibidem) from the same author, gives diameters of drains and sewers, capable of discharging 1250 gallons per house (of 25 feet front) per day, running three-fourths full at various rates of inclination. It should be said that the smallest sizes of the tables (below 3 or 4 inches diameter) are given only for the sake of completeness, and not as sizes to be recommended for actual use.

We shall assume, for an example, an ordinary city lot of  $25 \times 150$  ft. = .0861 acres. The rain-fall to be provided for may be 2 inches per hour. Though such storms are not frequent, provision should be made for them in the calculation of the size of house drains, as the rain falling on roofs and on paved yards reaches the drain very soon after having fallen. A rainfall of 1 inch per hour per acre very nearly

yields 1 cubic foot per second, therefore 2 inches per hour give 2 cub. ft. per sec. per acre. The number of cubic feet of rain from the above lot is therefore  $.0861 \times 2 = .1722$  cub. ft. per second or  $60 \times 1.722 = 10.332$  cub. ft. per minute.

We further assume 6 persons to the house, and 75 gallons per head per diem, which is a very liberal allowance. The waste water of the house is therefore  $6 \times 75 = 450$  gallons per day. If one-half of this amount is estimated to run off in 8 hours, the maximum per hour would be about 28 gallons or 0.0624 cub. ft. per minute. This quantity is so insignificant compared with the rainfall that we may safely neglect it.

If the drain has a fall of 1 in 60, and shall not run over one-half full, Diagram I shows that a pipe 4 inches in diameter is sufficient to carry off 10 cub. ft. per minute. Should the drain be allowed to run three-quarters full, and have a fall of 1 in 100, a diameter of  $3\frac{1}{4}$  inches would suffice, according to Table 1.

As a second example, I shall take a large lot, say  $80 \times 150$  ft. = .2755 acres. The quantity of rain to be discharged will be, under the same suppositions as above,  $2 \times 60 \times .2755$  acres = 33.06 cub. ft. per minute. The diagram I gives the necessary size of pipe, for a fall of 1 in 50, to be a little over 6 inches, supposing the drain to run half-full. For a drain, running  $\frac{3}{4}$  full, Table 1 gives the necessary diameter =  $5\frac{1}{4}$  inches.

These two examples are believed sufficiently to explain the use of the diagram and table appended. If the rain should be excluded, it will be seen from Diagram I that a 4-inch pipe, laid at a grade of 1 in 100, and running half-full discharges 7.5 cub. ft. per minute, or 10800 cub. ft. per 24 hours. Assuming 75 gallons or 10 cub. ft. per head per 24 hours, and doubling this to provide for a maximum flow, it will be seen that this quantity is equal to the sewage of  $\frac{108000}{20} = 540$  persons or of 90 houses (6 persons to a house).

For such calculations Table 2 of the Appendix becomes useful. It will be seen from it that a 6-inch drain, running three-quarters full, laid with a fall of 1 in 50, is large enough for the sewage proper of 400 houses, assuming 1250 gallons per house per day, which is an ample allowance.

The foregoing explanations have, I believe, sufficiently proved that *no house drain needs to be larger than six inches* under ordinary circumstances. Any increase of size beyond this would tend to be a detriment rather than a benefit.

#### DRAINS INSIDE OF THE HOUSE.

The earthenware drain should end at about 5 to 10ft. outside of the foundation walls of the house. From this point towards the

inside of the house the drain should be of iron. The joint between iron drain and earthenware pipe should be made with pure hydraulic cement. Where the iron pipe passes through the wall, a relieving arch should be built over it. Settlement of walls often occurs, and is liable to crack the pipe or even break it, unless the above provision is carried out. It is quite evident that, under no circumstances whatever, this part of the house drain should consist of vitrified pipe.

Important as it is to have the drains outside of the house free from sediment or leakage, it is still more so to have all the pipe joints inside of the dwelling perfectly air and water tight, for if any defect should exist here, sewer gas will leak into the cellar and pervade the whole house. For this reason we sometimes find the cardinal rule laid down that no drains should run under a house, but should be taken outside of it as soon as possible. This is not practicable, as a general rule, in the case of narrow city lots. Fortunately, however, we can, with perfect safety, run the drains across the basement or cellar floor of a dwelling, provided we choose the only safe material, i. e. *iron pipes*. A good mechanic is able to make with these a perfectly air and water tight joint.

The best course of the iron drains in the house is along the ceiling of the cellar, or along one of the foundation walls. In other words, wherever practicable, the iron drain ought to be kept *in sight*, in order to enable anybody to detect a leaky joint at occasional inspections. Sometimes fixtures located in the cellar, such as servants' water-closets, laundry tubs or sinks, make it necessary to lay the iron drain below the cellar floor. In this case it should be laid with proper fall in a trench, the sides of which are walled with brick work, and the base of which should consist of a layer of from 4 to 6 inches of concrete, thoroughly rammed and properly graded. The trench should be made accessible by closing it with movable covers of iron or wood.

If the drain is carried in sight, I would much prefer supporting it by strong iron hooks from the cellar wall, instead of suspending it by iron hangers from the main joists of the floor above. For, with the latter arrangement, a slight lowering or bending of the beams supporting the iron drain, would tend to loosen the joint between water-closet trap and soil pipe, as the latter is rigidly connected with the drain, thus creating a source of danger from leakage of sewer gas.

As regards the proper inclination of iron drains in the cellar the rules given for the outside drains should be observed.

The principles stated for the size of the outside drain apply with equal force to the inside drain. If no leaders enter the drain at its upper end or along its course through the house, a 4-inch pipe is ample for any ordinary sized dwelling; a 6-inch drain is very seldom required.

As a good precaution for repairs or cases of obstructions of the

drain, I would recommend the practice of many plumbers, which consists in inserting at distances of about 10 or 20 feet along the course of the iron drain Y branches, the ends of the branches being closed by a brass thimble, caulked into the hub of the Y, and closed by a trap screw. By opening these and inserting a proper cleaning tool, occasional obstructions by introduction of foreign matters are easily removed.

The course of the main drain in cellar should be as straight as possible. All changes of direction should be made by iron bends. All junctions with the main drain should be made by Y branches, in order to join the flow of both pipes without causing eddies; no right-angled junctions should be made in any horizontal or inclined pipe.

#### SOIL AND WASTE PIPES.

Into the iron drain the vertical soil and waste pipes enter by means of either quarter bends or by a Y branch with an eighth bend.\*

The best material for soil and waste pipes is cast iron. All cast iron pipes used in house drainage should be thoroughly sound, of a *uniform* thickness throughout, and must allow of ready cutting without splitting. The inside should be truly cylindrical and of smooth finish. The thickness of ordinary (so-called *light*) soil pipe is about  $\frac{1}{8}$  of an inch for 2, 3 and 4-inch pipes, and  $\frac{1}{4}$  to  $\frac{3}{8}$  of an inch for 5 and 6 inch pipe. For all large public or private buildings I should always insist upon the use of *extra heavy* soil pipe, which is about double as thick as the ordinary pipe. The weights of extra heavy pipe (as manufactured by the J. L. Mott Iron Works, N. Y.) are about as follows:

2 inch pipe,	5½lbs per foot.
3 inch pipe,	9½lbs per foot.
4 inch pipe,	18lbs per foot.
5 inch pipe,	17lbs per foot.
6 inch pipe,	20lbs per foot.

Great care should be exercised by plumbers, architects, plumbing inspectors and sanitary engineers in regard to the *uniform* thickness of iron soil pipe. The writer has lately seen specimens of extra heavy

\*As non-professional readers may be in doubt about the exact meaning of the terms drain pipe, soil pipe, and waste pipe, I quote the following clear explanation from the "Sanitary Engineer," Vol. 4: "The drainage system of a house, including the pipes or channels of any kind connecting it with the sewer or cesspool, may be divided into two parts — first, that part which is chiefly outside the house walls, and second, that which is generally inside the house. The first is called the *house drain*, or simply *drain*, and conveys the whole body of wastes from the house, including both the discharges from water-closets and urinals, and from baths, basins, sinks, etc., to the sewer or cesspool. The *drain* is practically *horizontal*, and may be considered as terminating either at the house wall, or at the most remote point at which it receives the pipes from any fixtures. The word *drain* is, however, also used in another sense as distinguished from *sewer*. It then means the pipe or channel which conveys only rain or ground water, as distinguished from *sewage*. An example of

soil pipe where the pipe was almost as thin as a knife blade on one side, while it had far more than the required thickness on the other side, the weight being as specified. Measuring the thickness of iron drain pipes by a pair of calipers should be recommended, but I am not aware that it is done at all now.

Iron soil pipe, the inside of which has been made smooth by dipping the pipe into a hot solution of coal-tar pitch, is superior to ordinary iron pipe. This coating, when applied to the outside of the pipe, forms a good preventive against rust or corrosion, and is better than any paint applied to the iron. Where economy is no object, the *enamelled* pipe may be used, which has a very smooth inside surface, thus securing to well-flushed soil pipes the greatest possible cleanliness. Whether iron pipes are coated with coal-tar pitch or enamelled, it is necessary, before applying either of these protective coats, carefully to test each pipe for defects, sand holes or cracks, by the hammer test. The coating may effectually cover these defects and render detection difficult.

Iron pipes are manufactured in lengths of 5 feet, with hub and spigot end, or else with double hub. In badly drained houses, with cheap plumbing work, it is not uncommon to find the joints of pipes made only with sand and paper, or with putty, mortar, cement, sulphur and pitch and red lead, or other material. All of these joints are worthless, and therefore extremely objectionable.

Joints of iron pipe should be made by first inserting a little picked oakum into the socket, care being taken that no part of this gasket enters the pipe. The oakum prevents the molten lead from running into the pipe, where it might form an obstruction to the flow. Molten lead is then poured into the hub, enough to quite fill it. As lead shrinks in cooling, it must afterwards be carefully hammered with a special caulking tool, thus filling the space between spigot and hub, so as to make a perfectly gas and water tight joint. In order to be able, at all times, to inspect the joints, it is a good practice to leave the caulked lead without a cover of paint, cement or putty, the marks of the caulking tool being thus left exposed to view.

A tight joint can also be made by a mixture of sal ammoniac, iron filings and sulphur. I am not sufficiently familiar with such "rust joints" to speak of their merits.

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this kind of drain is the separate system of pipes, used to convey only rain water in some towns and the tile pipe commonly employed in draining wet lands.

That part of the house drainage system which is generally inside the house, including the pipes from the various fixtures, is made up of *soil pipes* and *waste pipes*. *Soil pipes* are those pipes which receive *human excreta* from water closets and urinals, and they are still called soil pipes, even if they also receive the waste water from baths, basins, etc. On the other hand, *waste pipes* are those which receive *only* the waste water from these latter, but not the discharge from water closets and urinals. The *waste pipes* of a house may either enter the *house drain* independently, or join the *soil pipe* first and discharge their contents through it into the *drain*. As distinguished from the *drain* the *soil pipes* and *waste pipes*, at least for the longer lengths, are generally vertical "



The iron works manufacture not only straight soil pipe, but a large number of fittings, such as quarter bends, eighth bends, sixth bends, long and return bends, T branches, Y branches, double Y branches, half Y branches, offsets, single and double hubs, increasers, reducers, etc., to enable the plumber to make all possible connections and lines with iron pipe.

In England *lead pipe* is preferred for soil pipes. According to one of the best English authorities on plumbing\* the advantages claimed for lead pipe are briefly as follows:

1. It is smoother, cleaner, not so corrosive; more durable.
2. It can be bent to suit any position; it is more compact.
3. Its joints are more to be depended upon than iron pipe joints.
4. Urine, being very corrosive, acts more on iron than on lead.
5. Iron pipe rusts on the outside, and painting iron pipes, to prevent it, is expensive, and is generally not done thoroughly at the back of the pipe.
6. Lead branch wastes or traps cannot easily be joined to iron pipe.
7. Iron pipe does not allow caulking joints with lead, therefore cement is used for the joint.

From all this I disagree, for: 1. Tarred or enamelled iron pipe is fully as smooth as lead pipe, and the iron pipe is thereby well protected from corrosion.

2. The above enumerated variety of special fittings enables the plumber readily to adapt his iron pipe to almost any position; moreover I do not see why iron pipe should take up a great deal more room than lead pipe of same bore.

3. *Well caulked* joints of heavy iron pipes are just as sound and trustworthy as wiped joints in lead pipes, and any good mechanic is able to make them.

4. Urine does not corrode an iron soil pipe, protected by a coal-tar pitch solution or by enamel, more than a lead pipe.

5. The outside of iron pipe can be efficiently protected from rusting by paint, coal-tar pitch or enamel.

6. Lead cannot be caulked into iron, but a good plumber always solders a brass ferrule by a wiped joint to the lead pipe (or trap), and caulks the brass ferrule into the hub of the iron pipe.

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\*S. Stephens Hellyer, "The plumber and sanitary houses," 2d edition.

7. Any one who will take the trouble carefully to examine the joints of iron pipe, made by an honest and conscientious plumber, will readily admit the possibility of making tight joints with iron pipe. Only iron pipe of a sufficient strength to withstand the knocking occasioned by caulking the lead is used in American plumbing.

But, while iron pipe is fully equal in all the above respects to lead, it has great advantages over it. "Lead soil pipes are very heavy, and, therefore, liable to sag and split open, to have holes eaten into them by rats, and have nails driven into them by carpenters, and also to corrode, and they require much greater skill to put up, and involve more expense; therefore the statements\* above prove nothing, although they demonstrate the absurdity of bricking soil pipes into a wall, and the necessity of so placing them that they are at all times readily accessible for inspection; and also prove what few people seem to realize, that the drainage system of a house requires periodical testing and inspection just as much as a steam boiler or piece of machinery."†

The same remarks apply to the material of waste pipes; it is not uncommon, however, to find vertical waste pipes of lead, as these are much easier placed inside of a partition wall, and covered with plaster. But this cannot be regarded as good practice. It is certainly much preferable to run soil pipes and waste pipes in sight, so that they may be accessible. I decidedly condemn the usual plan of architects of building recesses or niches in the walls for pipes. The difficulty of caulking the back part of pipe joints in this position is very great. Where objection exists to having the pipes in sight, they should be boxed up, but I would always insist upon having the cover fastened by screws, which can be easily removed, and not by nails.

I have now to speak about the *proper size* of soil pipes and waste pipes. *Soil pipes* ought never to be larger than 4 inches inside diameter; this size will answer for even half a dozen water-closets on one vertical stack of pipe, and on different floors. I may here remark that, contrary to the generally entertained opinion, a nearly horizontal or inclined pipe can be kept clean by flushing much easier than a vertical pipe. The flushing water in this latter case soon assumes a whirling motion, and the scattered drops fall downward without exerting much scouring action upon the interior of the pipe. Hence the importance of having the inside as smooth as possible to prevent solid matters from adhering to the sides, where hardly any amount of flushing will take them off.

*Waste pipes* of iron should be 2 inches in diameter. This is ample

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\*In Hellyer's book, "The plumber and sanitary houses."

†See articles on "Plumbing Practice," in the Sanitary engineer, vol. 4.

for the waste water of one or more bath-tubs, and a large number of wash-bowls.

The arrangement of soil and waste pipes should be as direct as possible. It is desirable that each vertical stack should extend from cellar to roof in a straight line. In planning the plumbing for a dwelling too much care cannot be taken to secure such an arrangement. Every offset, every bend in the pipe forms an obstruction to its proper flushing, with both water and air. Horizontal soil pipes are especially objectionable; the water-closets, baths, bowls and sinks should always be located in groups, and as near to their respective pipes as possible. Branch pipes should always enter the vertical stack by means of a Y or half Y branch; a right-angled connection is objectionable.\*

If a lead pipe joins an iron pipe, the connection should be effected by means of a brass ferrule of same bore as the lead pipe, and soldered to it, wherever space allows, by a wiped joint. The ferrule is introduced into the hub of the iron pipe, and caulked tightly with a gasket of oakum and molten lead.

Iron soil and waste pipes should be supported at distances of not over 5 feet by strong iron hangers or hooks.

For all minor wastes *lead pipe* is used. It is manufactured in long coils, and can easily be handled. It may be bent and cut to suit all possible positions, and requires but few joints. It is manufactured of all sizes and of any desired thickness. In good plumbing work only heavy lead pipe should be used, to prevent its being quickly destroyed by the action of sewer gas. Lead pipes should be fastened to boards by soldering hard metal tacks to the pipe, and screwing the flanges of the tacks to the board. Joints in lead pipe are made with solder wiped around the junction.

The size of lead waste pipes should be as small as is consistent with the office which they have to perform. Wastes for bath-tubs or laundry trays should be sufficiently large to empty these vessels in a short time. J. C. Bayles, in his book "House Drainage and Water Service," recommends the following sizes and weights of lead pipe:

For bath wastes 1½ inches diameter, 3lbs weight per foot.

For bath overflows 1½ inches diameter, 2½lbs weight per foot.

For wash-basin wastes 1½ to 1¾ inches diameter, 2½ to 3lbs weight per foot.

For wash-basin overflows 1½ inches diameter, 2½lbs weight per foot.

For wash-tub wastes 2 inches diameter, 3lbs weight per foot.

For kitchen-sink wastes 3 inches diameter, 5lbs weight per foot.

Col. Waring, in an article upon the "Sanitary Condition of New York City," in Scribner's Magazine, speaks as follows: "Every waste-pipe and trap in the house should be restricted as much as possible,

\*Unless in the case of a small pipe, discharging into a very much larger pipe or vertical shaft.

the trap being never larger than the pipe, and preferably smaller. For example, the outlet of a kitchen sink should be of  $1\frac{1}{4}$  inch pipe, having a 1 inch trap. With a reasonable and sufficient use, this will keep clean and will remove everything promptly, while a 2 inch pipe with a 3 inch trap will become choked with grease and filth, and will be a constant seat of foul decomposition. . . . Even a set of laundry tubs will have their whole contents carried away by a  $1\frac{1}{4}$  inch pipe more rapidly than the flow can pass through the strainer of the waste."

After the completion of all piping in the house, it is a good practice—which should under no circumstances be omitted—to test the joints and pipes before connecting the fixtures to them. This is easily accomplished by placing a wooden plug, or, better, an India rubber disc into the end of the iron pipe outside of the foundation walls, thus shutting its mouth tightly. Then close all branch outlets inside the house, and fill the vertical pipes with water.\* Allow the water in them to stand for 24 hours; if at a subsequent inspection a lowering of the level of the water should be discovered, there must be a leak at some joint, or else some defect exists in the iron piping. Of course the leak must be found and repaired, and the test should then be repeated, until all joints are sure to be water- and air-tight.

Instead of this test by hydrostatic pressure, an equally reliable test is that with a force-pump and a manometer. Sometimes the "peppermint test" is used; but this seems more suitable for occasional inspections of older work. The test is thus described: "When called on to detect a leak in the soil pipe of a house, the plumber goes at once to the roof, if the soil pipe be carried above the roof; if not, he goes to the uppermost water-closet, and pours into one or the other something like an ounce of peppermint, and follows it up with enough water to insure its being carried the full length of the soil pipe. (The top of soil pipe should be closed, in order to prevent the oil from escaping into the outside air.) "Another man then traces the soil pipe from the bottom, throughout its course; knowing that if there is any crevice through which sewer gas can enter, the pungent odor of the volatile essential oil will be readily perceptible even in the presence of odors of a baser kind. Great care must be taken not to carry the peppermint about the house, otherwise the smell cannot be traced to the drains."

Another test is thus described by Douglas Galton: "To test the drains the fumes of ether or of sulphur may be used. If ether is poured down a soil pipe the fumes will be perceptible in the house at any leaks in the soil pipe or failures in the traps. Sulphur fumes may be applied by putting into an opening made in the lowest part of the

---

\*This test is impracticable in severe cold weather.

drain an iron pan containing a few live coals, and throwing one or more handfuls of sulphur upon the coals, and closing up the opening to the drain with clay or otherwise. The fumes will soon be very perceptible at any leaks or rat-holes in the soil pipe, drains or traps."

#### ESSENTIAL ELEMENTS OF A SYSTEM OF PLUMBING.

We have thus far considered only the material, size, general arrangement and manner of jointing the drain, soil and waste pipes in a house. We must now consider what the essentials of the system are, in order to secure to the house perfect immunity from sewer gas. Briefly stated, these essentials are as follows:

1. *Extension of all soil and waste pipes through and above the roof.*
2. *Providing a fresh air inlet in the drain at the foot of the soil and waste pipe system.*
3. *Trapping the main drain outside of the fresh air inlet, in order entirely to exclude the sewer air from the house.*
4. *Providing each fixture, as near as possible to it, with a suitable trap.*
5. *Providing vent-pipes to such water-seal traps under fixtures, as are liable to be emptied by syphonage.*

The diagram, Fig.4, showing a section through a city house, illustrates these essential elements of house drainage.

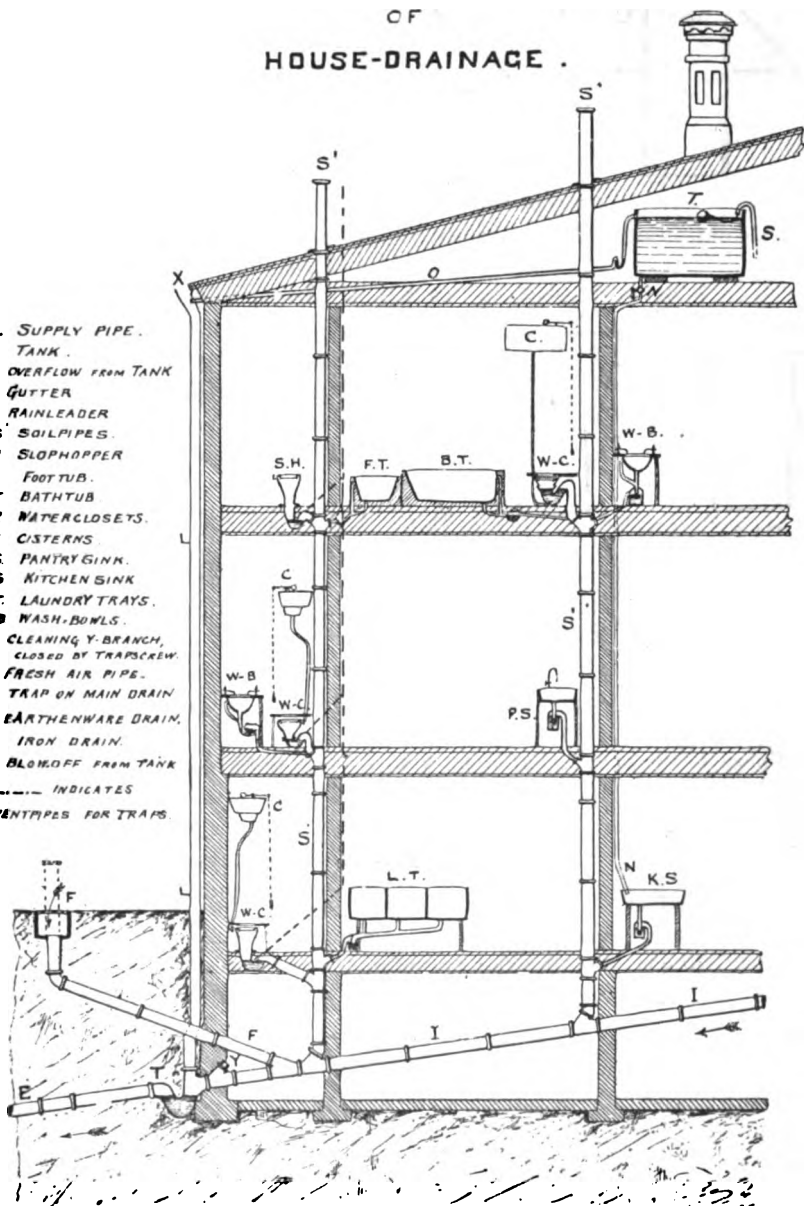
#### EXTENSION OF SOIL AND WASTE PIPES.

The *first* requirement asks for a vertical extension of all soil and waste pipes through the roof. This extension affords a ready outlet for all gases that would otherwise tend to accumulate inside the waste-pipe system. In the case of soil pipes nothing short of an extension the *full bore* of the pipe will answer this purpose. Waste pipes should be enlarged from the point where they pass through the roof, to four inches diameter, as smaller pipes are liable, in cold climates to become obstructed by the freezing of condensed vapor. Plumbers sometimes use galvanized wrought iron or tin pipes for this extension, but this is not to be recommended. It should be of the same material as the main soil pipe, and its joints should be worked with equal care.

The extension of soil and waste pipes should terminate at a distance from any windows, louvred skylights, or ventilating flues, and at least two feet below the top of the nearest chimney. It is desirable to have this extension as high as possible above the roof, so as well to expose the mouth of pipe to the influence of air currents. In order to pre-

# SYSTEM OF HOUSE-DRAINAGE .

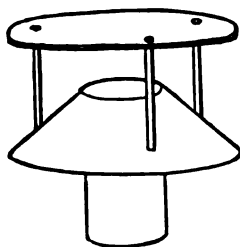
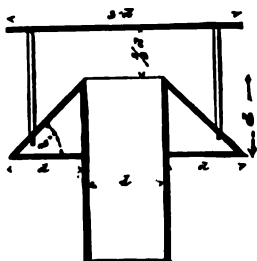
- S.** SUPPLY PIPE.  
**T.** TANK.  
**O.** OVERFLOW FROM TANK  
**X.** GUTTER  
**L.** RAINGLEADER  
**S.S.** SOILPIPES.  
**S.H.** SLOP-HOPPER  
**F.T.** FOOT TUB.  
**B.T.** BATHTUB  
**W.C.** WATER-CLOSETS.  
**C.** CISTERNS  
**P.S.** PANTRY SINK.  
**K.S.** KITCHEN SINK  
**L.T.** LAUNDRY TRAYS.  
**W.B.** WASH-BOWLS.  
**Y.** CLEANING Y-BRANCH,  
 CLOSED BY TRAP-SCREW.  
**F.** FRESH AIR PIPE.  
**M.** TRAP ON MAIN DRAIN  
**E.** EARTHENWARE DRAIN.  
**I.** IRON DRAIN.  
**N.** BLOW-OFF FROM TANK  
 ----- INDICATES  
 VENTPIPES FOR TRAPS



**Fig. 4.**

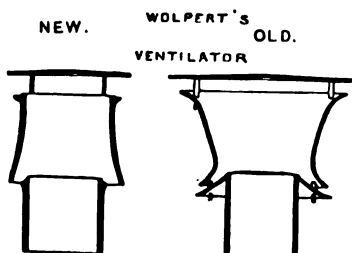
vent any obstruction of the soil pipes, plumbers often cover the

*Fig. 5.*



EMERSON VENTILATOR.

the invention of a German engineer, which is shown in Figure 6 in



*Fig. 7.*

*Fig. 6.*

its old and in Fig. 7 in its improved shape. The best plan seems to be to do away entirely with any cover to the soil pipe mouth. Capt. Douglas Galton, in his book "Construction of Healthy Dwellings," says in regard to this: "A tube or shaft with an open top acts best. It is, however, necessary to protect the top to prevent rain from entering the tube; but a cover

tends more or less, according to its shape, to delay the current in the tube or shaft." This necessity of covering ventilating tubes, to protect them from rain, does not exist in the case of soil pipes; these may only want protection against malicious introduction of stones or similar articles. A galvanized iron wire basket set into the mouth of the soil pipe will answer this purpose.

There is no doubt that open-mouthed pipes have a better upward ventilation than pipes covered with cowls, if the wind blows horizontally or nearly so. Wolpert\* in his "Treatise on Ventilation and Heating" states the average useful effect in per cents. of the velocity of the wind, as derived from a number of experiments, to be:

68.6 per cent. for open-mouthed tubes.

51.9 per cent. for pipes capped with Wolpert's new cowl.

35.8 per cent. for pipes capped with Wolpert's old cowl.

for a horizontal direction of the wind. In other words, the upward suction in a tube without any cowl is in the average equivalent to over  $\frac{2}{3}$  of the force of the wind, blowing over it in a horizontal direction. For pipes capped with Wolpert's new cowl it is only a little more than  $\frac{1}{2}$  of the wind force, and for the old cowl it is  $\frac{1}{3}$  of it. As an average

\*The inventor of the above illustrated ventilator.

for other directions of the wind Wolpert finds the upward draft in pipes covered with his new and old cowls to be 51.5 per cent. and 34.5 per cent., respectively, of the wind force.\*

The results of an elaborate series of about 100 experiments upon ventilating cowls, made on seven different days, at different times of the day, and under different conditions of wind and temperature, by Messrs. W. Eassie, Rogers Field, and Douglas Galton was as follows. "After comparing the cowls very carefully with each other, and all of them with a plain open pipe as the simplest, and in fact only available standard, the sub-committee find that none of the exhaust cowls cause a more rapid current of air than prevails in an open pipe under similar conditions, but without any cowl fitted on it. The only use of the cowls, therefore, appears to be to exclude rain from the ventilating pipes; and as this can be done equally, if not more efficiently, in other and similar ways, without diminishing the rapidity of the current in the open pipe, the sub-committee are unable to recommend the grant of the medal of the Sanitary Institute of Great Britain to any of the exhaust cowls submitted to them for trial."

#### FRESH AIR INLET.

The *second* requirement calls for a fresh air inlet or fresh air pipe. This is no less important than the extension of the soil pipes through the roof. In order to effect a constant movement and change of air in the pipes, two openings are required, an outlet and an inlet. The extension of the soil pipe through the roof provides only an escape for the foul air generated in the soil pipes and waste pipes through the decomposition of foul organic matter, clinging to the interior of pipes and lodging in traps under water-closets and fixtures. But in order to oxidize and thus render harmless this matter undergoing putrefaction within the pipes, a constant introduction of fresh air from the outside atmosphere is necessary. As the soil pipe is warmer in winter time (being in the constantly heated house) than the fresh air pipe, located outside of it, an almost constant upward current in the soil pipe results. In summer time this current is only seldom reversed; for, as a general rule, the top of soil pipe is heated by the sun more than the fresh air pipe near the ground.

There is a second and almost equally important reason for providing a fresh air inlet, wherever the third requirement, the trapping of the

\*The current of air in these experiments was created by a powerful fan, the velocity of the current varying from 8 to 31 metres per second (from 17.9 to 69.3 miles per hour), equivalent to high winds and hurricanes respectively. The diameters of the cowls tested varied from 0.787 to 3.937 inches. It is to be regretted that the author did not extend his experiments so as to include much smaller velocities of current. It is very likely that for the latter the percentage of useful effect of cowls would be much smaller.



drain, has been complied with. Referring to Fig 8 it will be seen

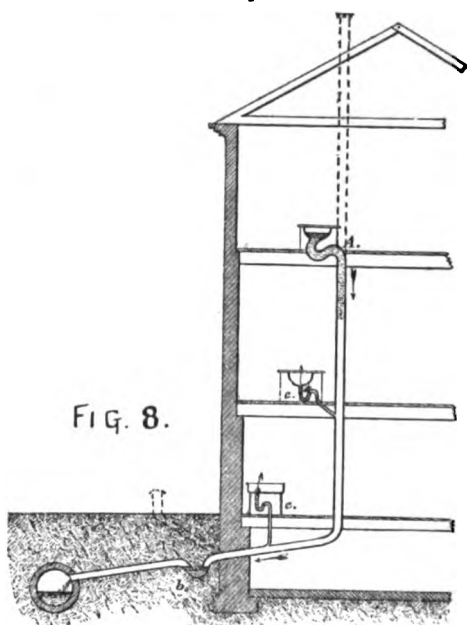


FIG. 8.

that, if a water-closet is used the water discharged into the soil pipe acts like a piston; although it is not likely to fill a 4-inch pipe, it certainly carries the air on its course downward with it by friction. Thus the descending water drives air before it and out through the fresh air pipe; if this had not been provided, it would very likely force the nearest traps under fixtures, and send a puff of sewer gas into the living rooms. This reversed action of the fresh air inlet does not occur sufficiently often to warrant the apprehension of any danger in the location of the inlet.

Of course, it should not be too near under windows of living rooms or dormitories. It may be carried away from the house for some distance; it may be placed in the same manhole with the trap (Fig. 9),

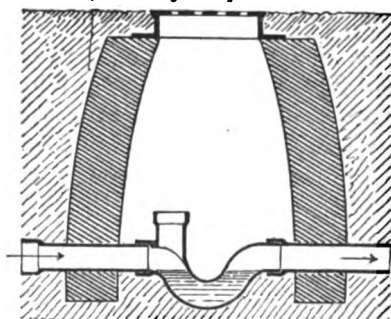
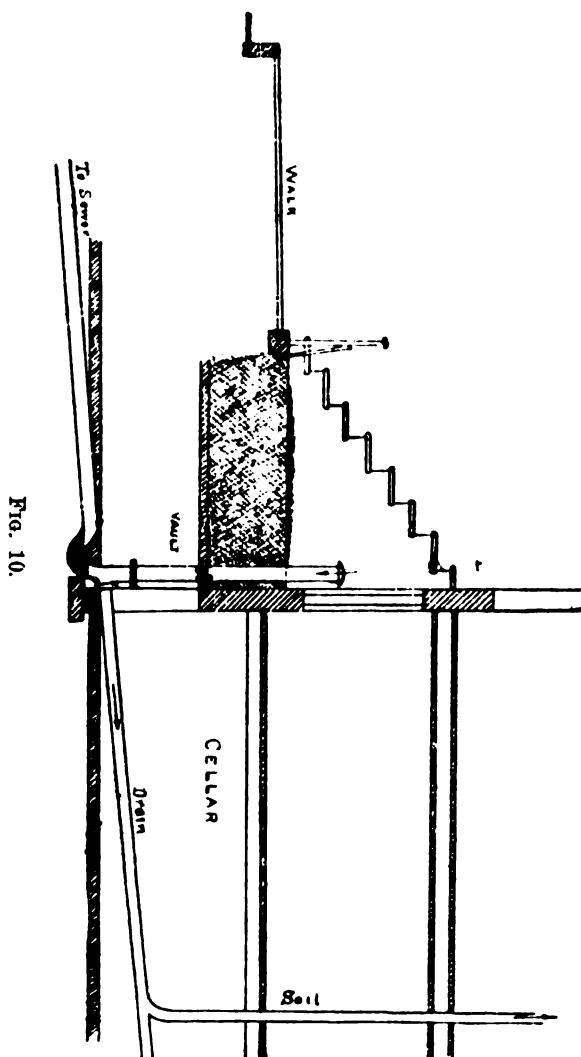


FIG. 9.

or it may enter the drain near the foundation wall, just inside of the house, by a T or Y branch (Fig. 4). In rare cases it becomes necessary to carry the fresh air pipe vertically upward through the roof (Fig. 16); this plan would neither be very efficient, as the difference in temperature of inlet and outlet pipe would be small, nor very economical.

Figs 10-18 illustrate various modes of locating fresh air pipe, compiled from actual observations, by Walter G. Elliott, C. E., for the "Sanitary Engineer," Vols. 4 and 5.

As regards size of the fresh air pipe, I would say that nothing short of the diameter of the iron drain would answer; as this is generally 4 inches in diameter, a 4-inch opening for fresh air pipe is required.



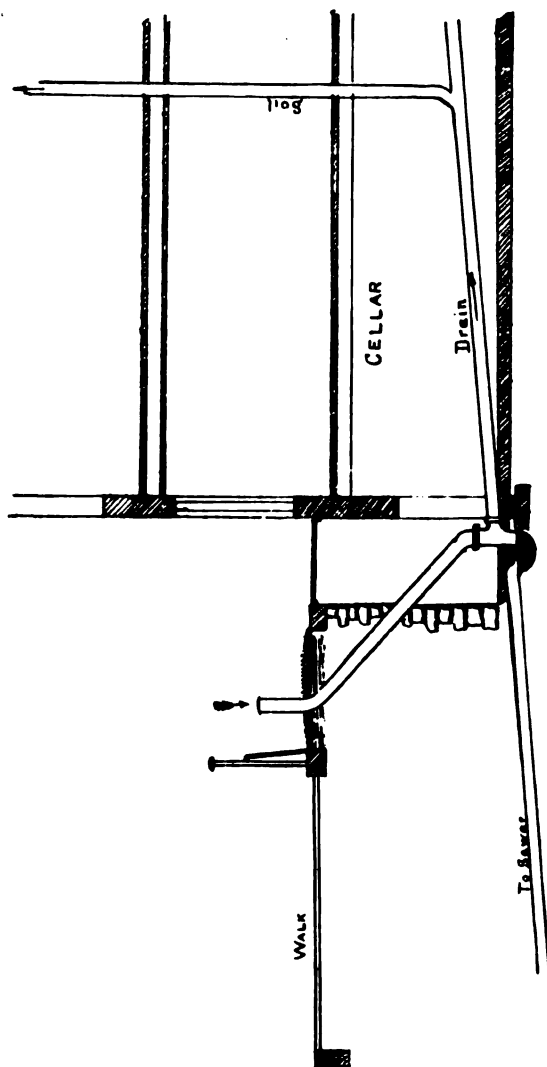


FIG. 11.

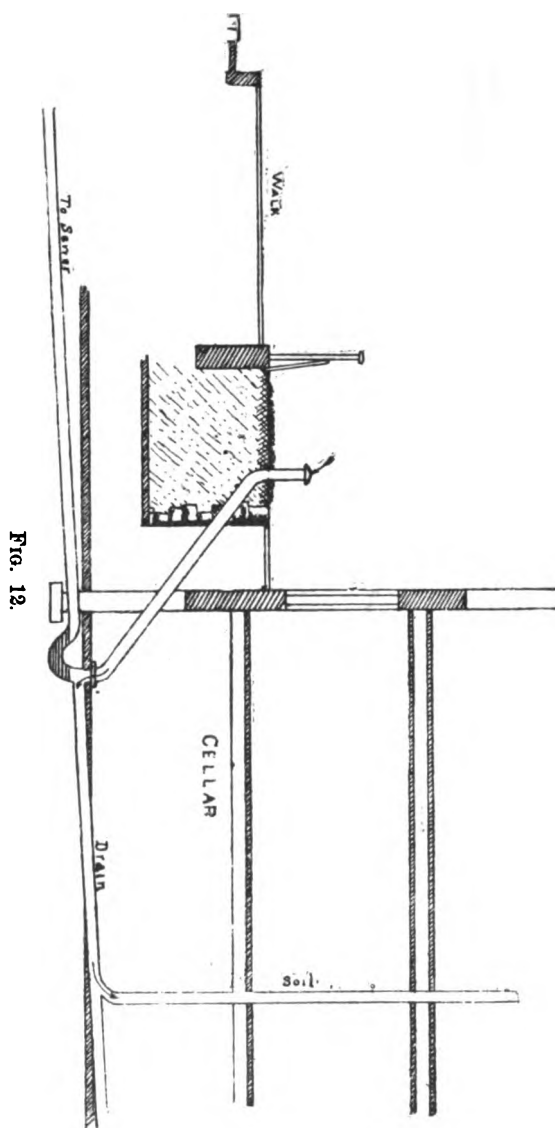


FIG. 12.

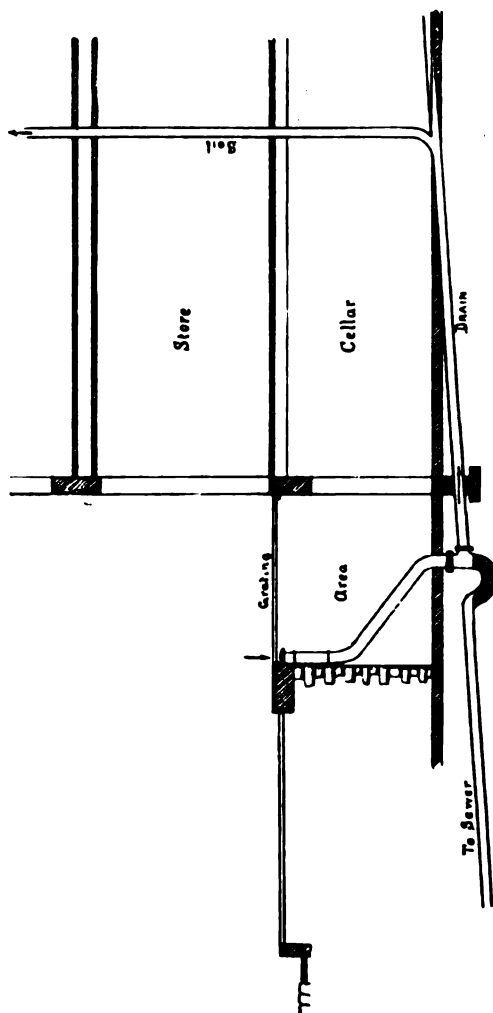


FIG. 13.

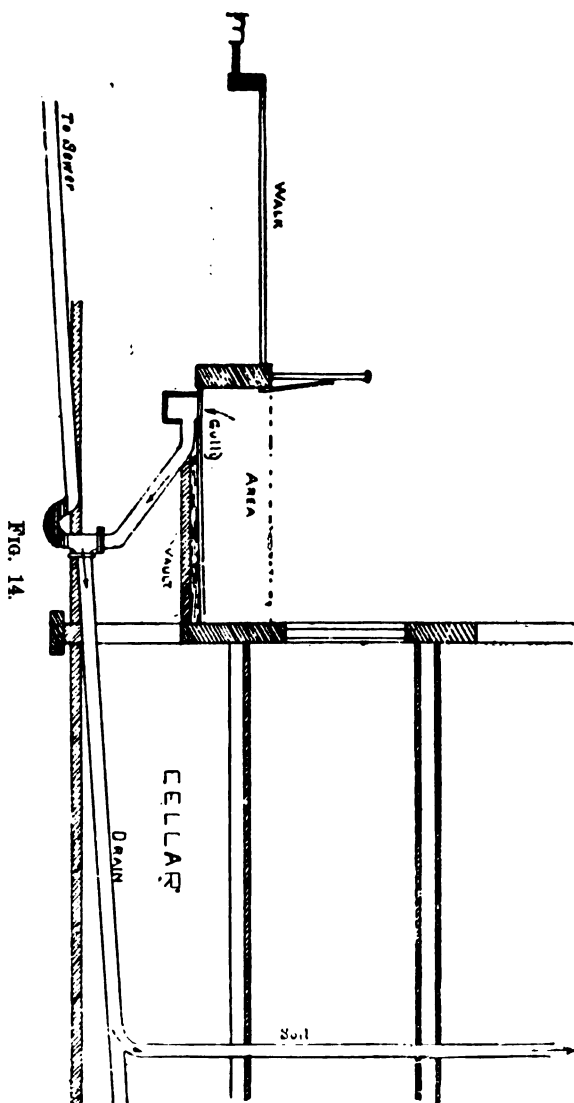
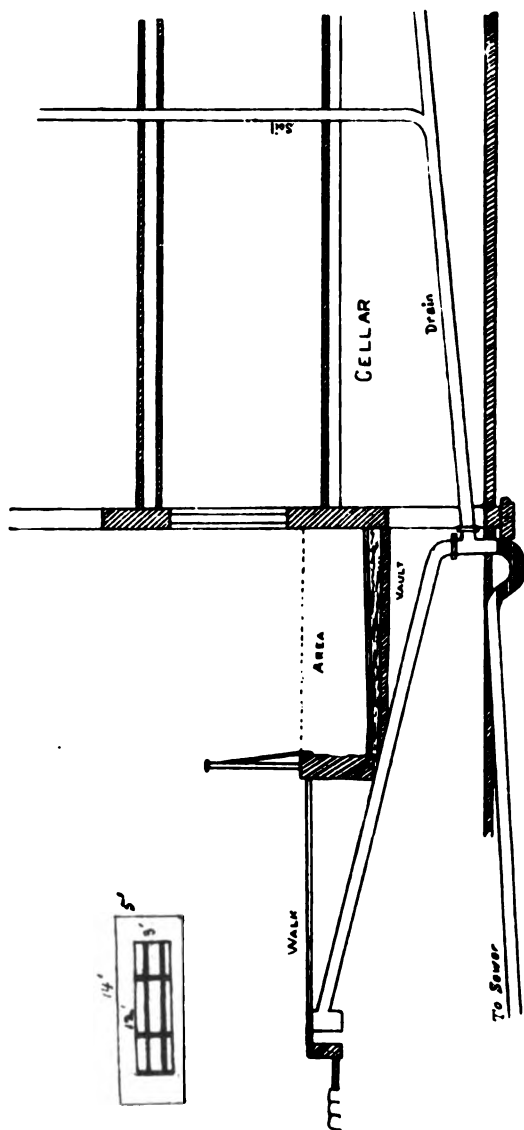


FIG. 14.



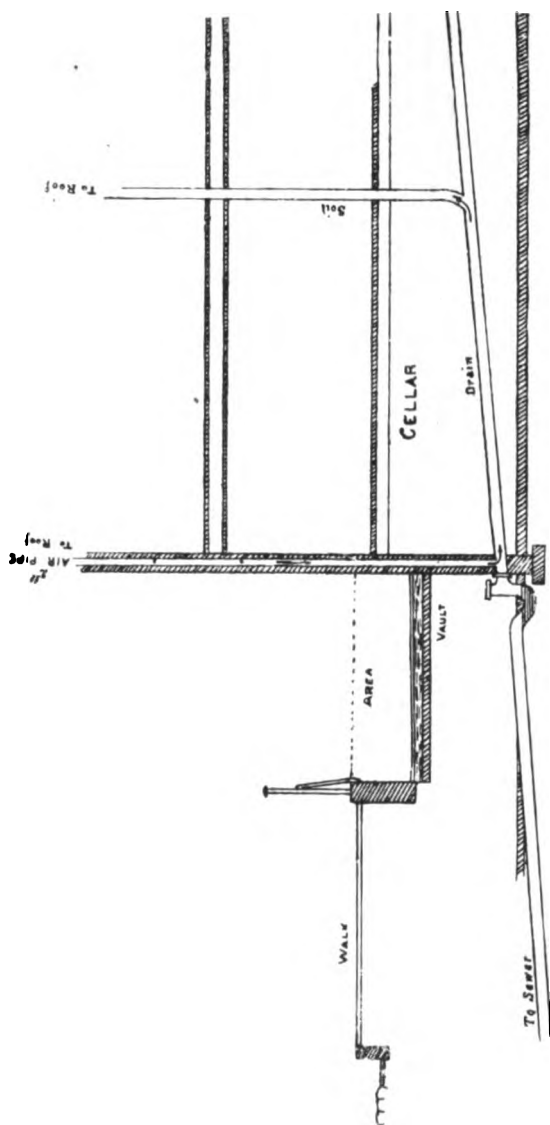


FIG. 16.



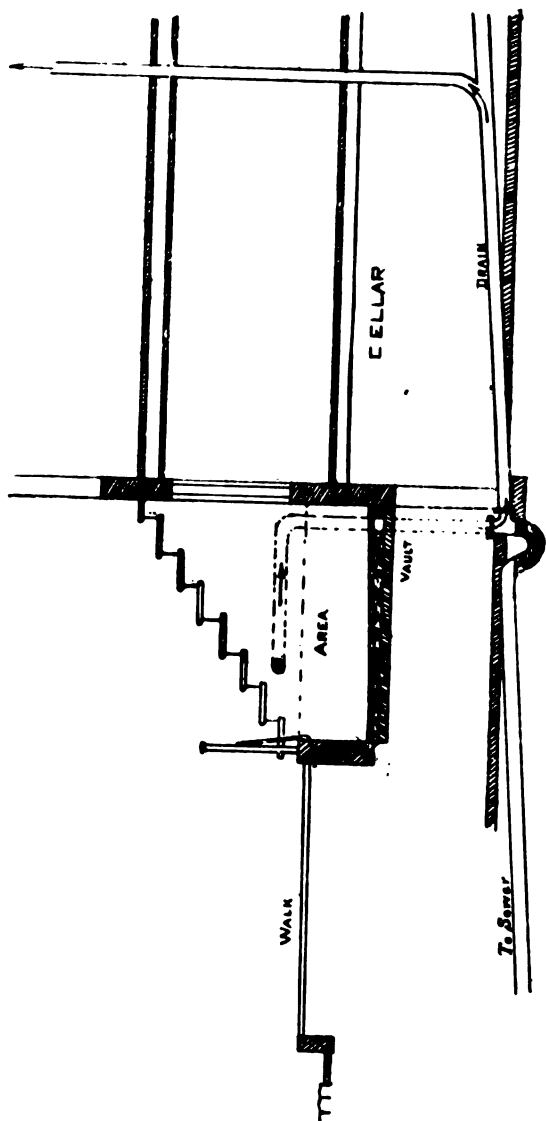


FIG. 17.

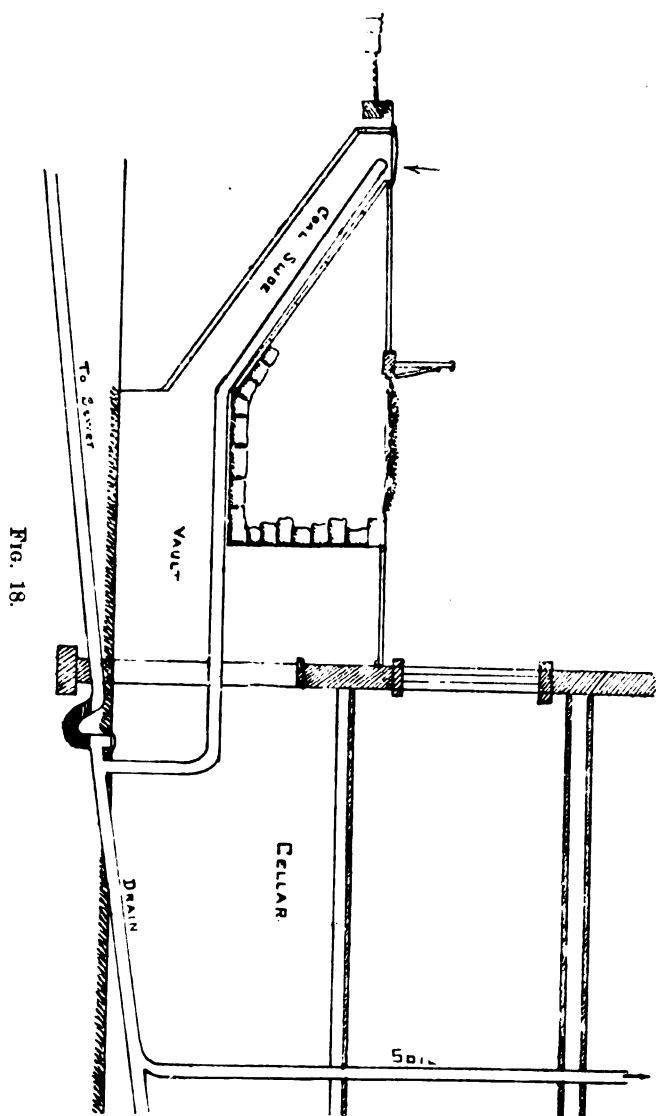


FIG. 18.

## TRAP ON MAIN DRAIN.

Our *third* requirement calls for a trap on the main drain between the sewer, cesspool or flush tank and the fresh air pipe. A *trap* is practically a suitable bend or dip in the drain, which retains a sufficient quantity of water to prevent the passage of air or sewer gas from the sewer to the house drain. Fig. 19 shows the common running trap, as manufactured in earthenware. Fig. 20 shows a cast iron trap as manufactured by the J. L. Mott Iron Works, N. Y., with a cleaning and inspection hole at the house side of the waterseal,

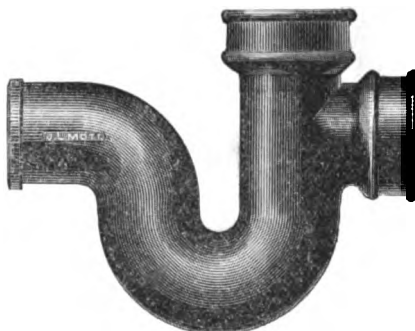
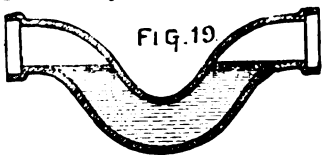


FIG. 20.

easily accessible and in sight at all times. A trap, such as Fig. 21 illustrates, is then used, having a cleaning hole with a cover. Care should be taken to close this opening perfectly air tight. A combination of trap and fresh air inlet,

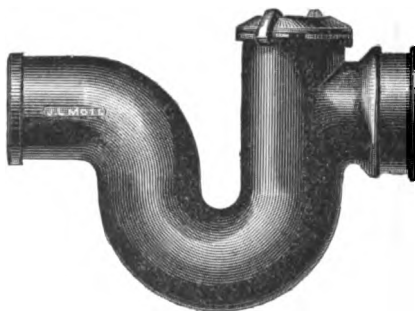
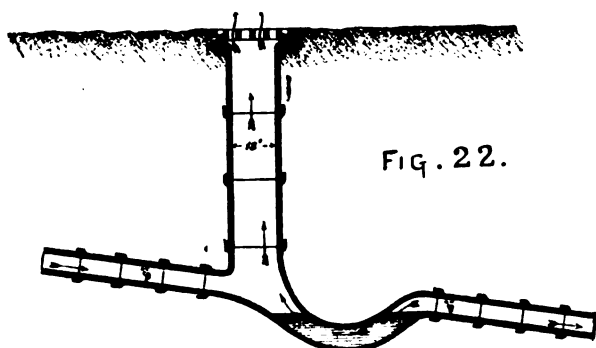


FIG. 21.

which serves in some cases, when the trap is placed in a man-hole outside of the house (Fig. 9), covered by an open grating, as a fresh air inlet. In other instances (Fig. 4) a leader is introduced into this opening, and the trap receives abundant flushing at each rain-fall. Sometimes the running trap is located on the line of the iron drain, just inside the house-walls (Fig. 39), so as to be easily accessible and in sight at all times. A trap, such as Fig. 21 illustrates, is then used, having a cleaning hole with a cover. Care should be taken to close this opening perfectly air tight. A combination of trap and fresh air inlet, located outside of the house, is shown in Fig. 22, which is taken from a circular on house drainage of the Massachusetts State Board of Health. Various locations of traps are illustrated in Figs. 10-18. In all cases the trap should be so located as not to be liable to freeze in cold climates or exposed localities.

Of late the question has been discussed whether this trap on the main drain is necessary and useful or should be omitted. The objec-



tions urged against the use of traps are as follows:

1. They impede the ventilation of the public sewers.
2. They form an obstruction to the flow of the sewage in the house drain, and are, therefore, the cause of accumulations of foul matter in the drain, which by its decomposition will generate noxious gases; also
3. Foul matters will lodge in the trap.

While the first objection does not strictly belong to the subject of this paper, I will say that it is accepted by most authorities that house drains and soil pipes should not be used as ventilators for the street sewers. In exceptional cases—such as, for instance, where an entirely new sewerage system is built, designed and constructed according to uniform plans, and where not only the construction of sewers, but also the house plumbing is under constant supervision of the engineer and designer of the system\*—the trap (and consequently the special fresh air pipe) may, perhaps, be left out. But I believe that a proper ventilation of sewers can be effectually carried out without ventilating through the houses.†

In regard to the second and third objections, I would say that obstructions do not frequently occur if the drain is carefully laid, with sufficient and continuous fall to insure a cleansing velocity of the flow. If such an inclination cannot be given to the drain, proper flushing appliances should be used, and these will, certainly, by daily or more frequent washings, insure the removal of all matters liable to lodge in the trap. Another most necessary precaution to prevent accumulations in the trap, where the fall is very slight, may be found in the use of a proper grease-trap, about which I shall speak hereafter.

No amount of care in laying the drain will prevent its obstruction

\*For instance, at Memphis, Tenn., and at Hamburg, Dantzic, Frankfort-on-Main, Berlin, Breslau and other places in Germany.

†See Mr. Edward S. Philbrick's article on "Ventilation of Sewers," in the *Sanitary Engineer*, Vol. I. See also *Sanitary Engineer*, Vol. V., Number 12, page 246.

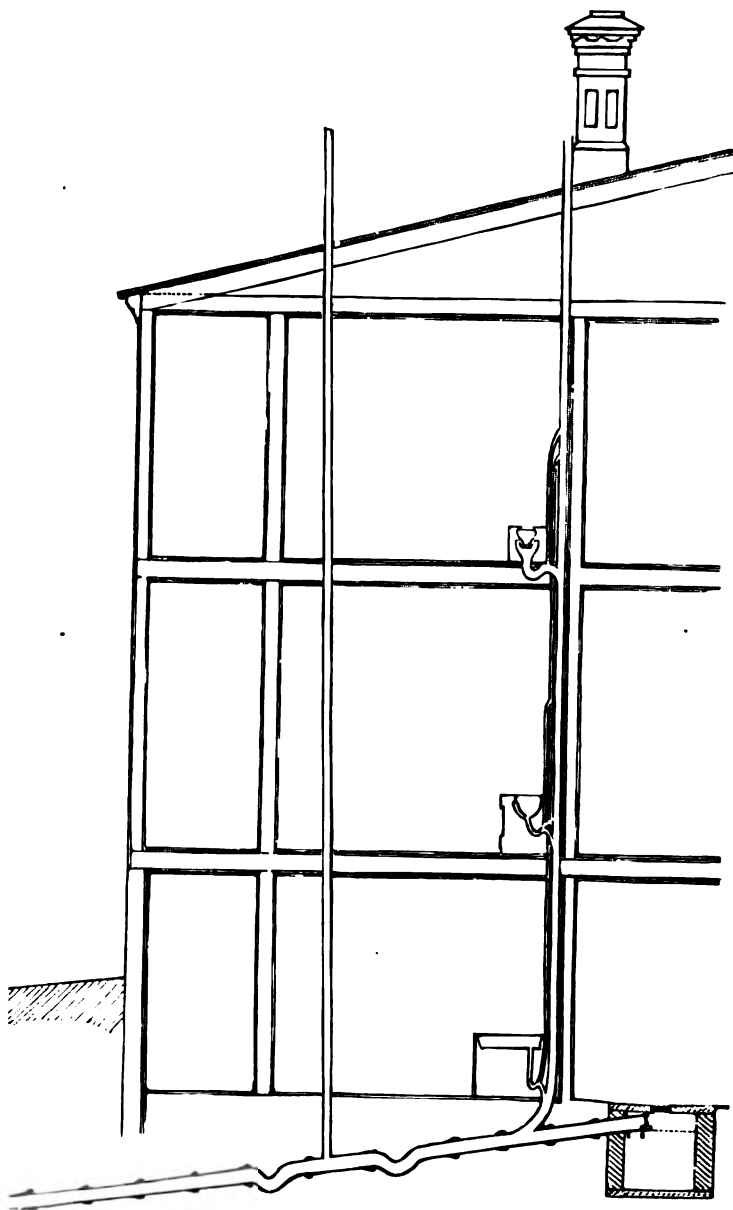
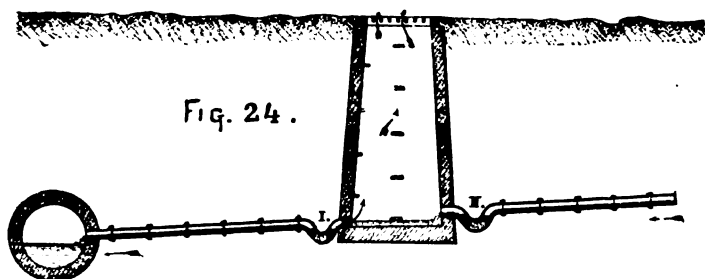


FIG. 23.

through carelessly introduced articles; these will mostly lodge in the trap. A cleaning hole should therefore be provided with the trap, and is rarely omitted in good work, or else a Y branch, closed with a trap-screw, should be inserted just a little above the trap (Fig. 4).

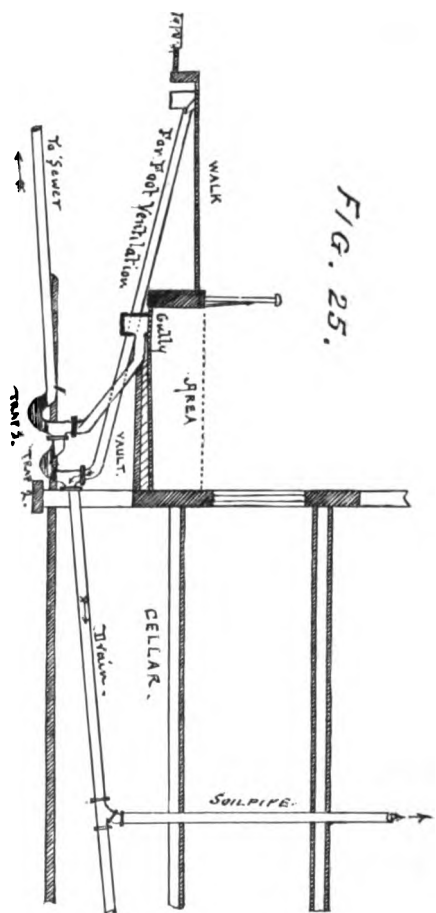
In Vol. III. of the "Sanitary Engineer" will be found a discussion of the advisability of trapping the main drain. My own opinion, as stated in a communication to that journal, is as follows:

"If we could have *ideal* sewers, house drains and soil pipes, it might perhaps be possible to dispense with such a trap altogether. But since all sewers may have temporary stoppages from some cause, since house drains may settle or leak, and joints of soil pipes crack, thus allowing sewage matter to undergo putrefaction and enter the interior of houses, I would in all cases advise the use of a safeguard, consisting in a disconnecting trap and a *well ventilated soil pipe*. This latter arrangement is a *conditio sine qua non*, and rather than have a trap *without* ventilation I would advise to have none at all. . . . I would always condemn as unsafe a system of house drainage in which the public sewers are ventilated through the houses. . . . The work of ventilating public sewers should, in my opinion, be done by the same public authorities who devise the sewer system, and not by the householders."



Leaving aside, however, the case of a house drain connecting with a public sewer, it seems quite evident that, in the case of a house discharging its sewage into a cesspool, an effective barrier should be imposed to the gases constantly generated in that receiver of all foulness from the household; and equally so in the case of a flush tank which temporarily holds a large amount of fæcal and other refuse matter, which sometimes undergoes decomposition.

In those exceptional localities where undue pressure in the sewer — from wind blowing into the outlet of the sewer, or from sudden changes of temperature (when exhaust steam is allowed to enter a sewer), or from heavy accumulations of surface waters gorging the sewer, or from the action of the tide in tide-locked sewers — frequently forces the seal of the trap, two running traps with a proper vent pipe between them may be used. In such a case, however, the fresh air pipe should enter the house drain above the upper trap. The arrangement shown in Fig. 23 is therefore not a safe one, as no fresh air pipe enters the soil pipe at its foot. Fig. 24 shows an arrangement



of two traps on the line of the drain, with an open channel at the bottom of a man-hole between the traps, which is sometimes adopted when the sewer is located in an alley at the rear of the house. Fig. 25 shows the arrangement of a double trap and fresh air pipe when the sewer is in front of the house.\*

#### TRAPPING OF FIXTURES.

The *fourth* essential, as stated above, calls for a suitable trap, placed as near as possible under every fixture. These traps become a necessity, since much of the so-called "sewer gas" is actually generated in the very drains and soil pipes of the house. The trapping of the main

\*Proposed by Walter G. Elliot, C. E., in the Sanitary Engineer, Vol. III.

drain would prove ineffective, and would offer no protection whatever against the foul gases derived from organic matter decomposing within the pipes.

Traps should be located as close as possible to fixtures, in order to reduce the length of waste pipe on the house side of the trap, which is liable to become foul with long use. Probably the best material for traps is lead, as this permits of making a good joint with the lead waste-pipes. As Mr. Hellyer has truly pointed out, the junction of the trap with the waste pipe is of far more importance than its junction with the fitting, because the former is on the sewer side of the trap, and, unless properly made, would afford a passage for gases from the waste pipe system into the rooms.

Whatever kind of trap may be used under fittings (and there is an endless number of such patented devices), it is of the greatest importance that the trap should be *self-cleansing*; for this reason traps with square corners or large spaces, liable to accumulate dirty matter, are objectionable. Much depends on a proper size of traps for waste pipes: the smaller the trap the better will it be washed clean. As a good rule I would recommend to choose a trap a quarter or half an inch smaller than the diameter of the waste pipe, to which it is attached. The flushing stream is thus concentrated, and its scouring power increased within the trap, while on the other hand a trap an inch larger than the waste pipe is sure to fill up in time with sediment.

The following will serve as a guide:

Traps under water-closets with 4in. soil pipe should be 3½in. to 4in. diameter.

Traps under wash-basins with 1½in. to 1¾in. waste pipe should be 1in. to 1½in. diameter.

Traps under bath- and foot-tubs with 1½in. waste pipe should be 1½in. diameter.

Traps under laundry-tubs with 1½in. to 2in. waste pipe should be 1½in. to 1¾in. diameter.

Traps under sinks with 1½in. to 2in. waste pipe should be 1½in. to 1¾in. diameter.

Traps under slop sinks with 2in. to 3in. waste pipes should be 1½in. to 2in. diameter.

As regards the proper dip of traps I would say that traps under those fittings which receive solids (water-closets) should not have a greater dip than 1½ to 2 inches, because otherwise the solids are not readily removed, and lodge in the trap. For traps of minor wastes a larger dip or "water-seal" is advantageous, as affording a protection against loss of seal through evaporation, siphonage or back pressure.

Traps may be classified according to the means used for the exclusion of gases into:

1. *Water-seal traps,*

2. *Mechanical traps*



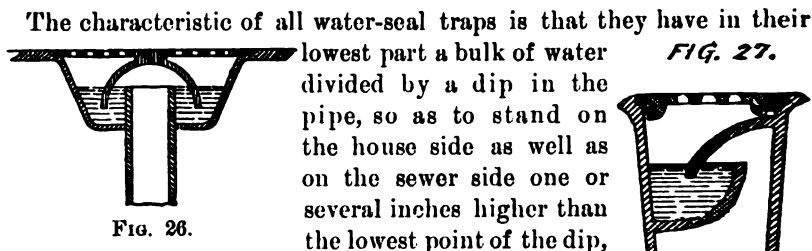


FIG. 26.

thus making a seal which, under ordinary circumstances, prevents the passage of gases.

The traps of the second class have, in addition to the water-seal, a mechanical contrivance such as floats, balls, valves, flaps, etc., to exclude sewer gas.

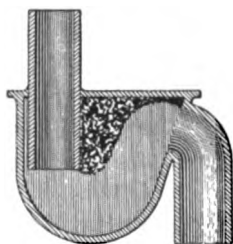


FIG. 28.

Among the water-seal traps I mention the old fashioned D trap, the bell trap, Antill's trap, Adce's trap, the bottle trap, the common S trap, half and three-quarter S traps, etc. There is an endless variety of mechanical traps, amongst which I mention Bower's trap, Cudell's trap, Garland's trap, Waring's check-valve, Buchan's trap, Nicholson's mercury-seal trap and others.

The bell trap (Fig. 26) is objectionable on account of insufficient water-seal and improper shape. It is frequently found at the outlet of sinks, and, being in its upper part a strainer, it is often removed by servants or thoughtless persons, and the gases from the drain-pipe then freely enter the house.

Antill's trap (Fig. 27) avoids this defect, having a *fixed* strainer, but is objectionable on account of shape and small water-seal.

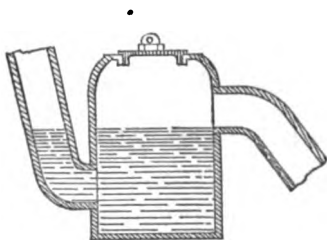


FIG. 29.

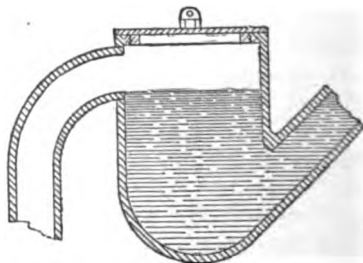


FIG. 29a.

The D trap (Fig. 28) and the bottle trap (Fig. 29) constitute small cesspools; they violate the principle that a trap ought to be self-cleansing. The D trap accumulates dirt and grease in the upper corner (see Fig. 28), which receives no scouring from the water passing through the trap; and the bottle trap very often chokes up as shown in Fig. 30. Both traps are then practically S traps. Fig. 29a illus-

trates a bottle trap of improved shape, which may keep cleaner on account of its round bottom. Adeo's traps (Fig. 31) are little better in this respect, though they have this to recommend them, that they are not easily siphoned, having a large air space above the water, and a large body of water in the trap.

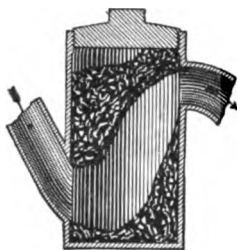


FIG. 30.

The S traps and half S traps (see Fig. 32) are shaped so as to be self-cleansing, being of uniform diameter throughout, and having no nooks or corners.

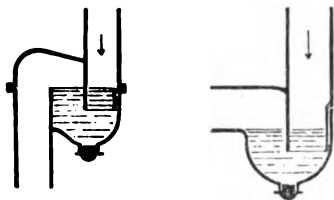


FIG. 31.

They fail sometimes by siphonage, or by evaporation of the

water.

Bower's trap is shown in Fig. 33. This trap has a water-chamber into which the pipe from fitting enters at the center, and an outlet pipe on one side. The mouth of the inlet pipe is sealed by the water

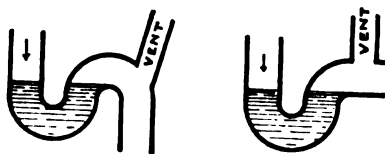


FIG. 32.

in the chamber, but in addition to this a floating ball of India rubber in the water-chamber is held tightly against the mouth of the inlet pipe, forming a seal, which, however, depends on the quantity of water in the chamber. The water, in passing through this trap, removes the ball from its seat and rotates the same, thus keeping it clean and free from matters adhering to it. An additional advantage of this trap lies in the ball, which, being compressible, allows the water in the chamber to freeze without danger of the bursting of the cup. Unless the soil pipe is extended full size through the roof this trap may have its water lowered by siphon-

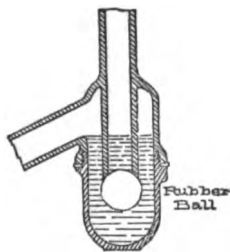
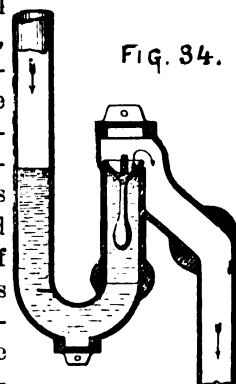


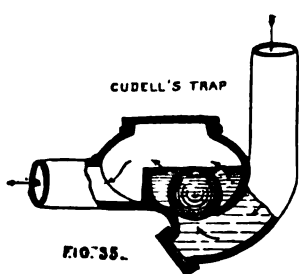
FIG. 33.

age so much that the ball will drop from the mouth of the inlet pipe, but with proper ventilation of soil and waste pipes it forms an efficient trap for wash-bowls, tubs and sinks.

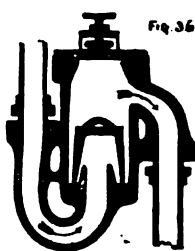
Waring's check-valve is shown in Fig. 34. This valve forms a seal by its weight, and the seal is dependent upon the accuracy of the



turned seat. Hair and particles of other matters may adhere to it and prevent a tight shutting of the valve.



Cudell's trap (Fig. 35) is constructed much upon the same principle, but has a heavy metallic ball instead of a conical shaped valve. This ball may keep cleaner by being revolved, but in this case, as above, the tightness of the seal



will depend upon the accuracy of turning the seat.

Nicholson's mercury seal trap (Fig. 36) has an inverted porcelain cup inside of its cylinder, the edge of which rests on mercury, forming a tight seal. The cup is lifted, at each discharge, by the force of the water entering at bottom of cylinder; after all water has passed from the basin the cup falls back in its place. This trap is generally made of earthenware with brass couplings; it is therefore a more expensive trap, but the mercury seal very efficiently prevents the entrance of sewer air, even if the water in the cylinder should be removed by siphonage or evaporation.

#### VENTING OF TRAPS.

The *fifth* requirement asks for a proper vent pipe for such water-seal traps as are liable to be siphoned. This siphonage constitutes in many cases a danger, especially so with S traps. Traps may be siphoned under the following conditions:

1. Traps with an easy bend, on a rather steep line of waste pipe, and with small seal, are liable to empty themselves by the momentum of the water rushing from the fitting through them. The air in the upper bend of the trap is expelled and replaced by water, which causes the trap to act as a siphon. When the fitting has discharged all its water, and air breaks the siphon, the water in its inner limb will mostly drop back into the trap, but in case of a small dip it would be insufficient to seal the trap. Unless a slow after-flush takes place the trap remains unsealed.
2. Traps under fixtures may be siphoned by water coming from another fitting on the same waste pipe.
3. Traps may be siphoned by a discharge—from a water-closet, a tub, or from a pail of water from a slop sink—into the main soil pipe, to which the branch waste of the trap is connected.

To guard against the *first* danger the dip or water-seal of the trap should be as great as possible; but, even then a special vent-pipe will often be necessary, attached to the highest part of the bend in the trap on the sewer side of the water-seal (Fig. 32), or else a mechanical trap should be used.

To guard against the *second* danger the S trap should be vented, or a mechanical trap should be used; wherever possible, each fixture should discharge independently into the soil pipe, thus reducing the danger from siphonage to case 1 and 3.

The *third* danger from siphonage by a discharge into the main soil pipe, either above or below the point, where the waste from the trap enters it, will in some cases be sufficiently prevented by the complete and thorough ventilation of the soil-pipe [see requirement 1 and 2, page 276 and page 279]. In other cases the venting of the trap becomes necessary.\*

Where a number of water-closets discharge into the same inclined branch of a soil pipe the air-vent to the water-closet trap becomes necessary, especially so with water-closets, discharging quickly a large body of water, such as the various patterns of the plunger-closets (Zane, Demarest, Jennings) and some of the "washout" closets.

It is often not only costly but also inconvenient to run vent pipes to the roof. I am, therefore, inclined to prefer a good mechanical trap which cannot be siphoned provided the soil and waste pipe system has ample ventilation. Such a trap may be used under sinks, tubs and bowls. But for water-closets and slop-hoppers without a strainer the simple lead water-seal trap, vented wherever necessary, is the only safe device.

The material most suitable for air-pipes is lead, as such pipes are easily joined to lead traps. Sometimes wrought-iron tubing is used, and, since the vent pipe is not so much intended for carrying off foul gases [which office is performed by the vertical extension of all waste pipes through the roof] as to afford a passage to air in order to break the suction, they may be safely used. Care should be taken to lay these pipes with a slight inclination, in order to prevent accumulation of water from condensation in the pipes. Vent pipes for fixtures on different floors may be joined, if convenient, and may enter the soil pipe above the highest fixture (Fig. 37). But it is preferable to run

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\* The writer was lately engaged in making, under direction of Col. Geo. E. Waring, Jr., a very complete and interesting series of experiments upon the siphonage of traps, for the National Board of Health. He much regrets not being at liberty to refer to these experiments, as the official report upon them has not yet been published by the National Board of Health.

WM. PAUL GERHARD.

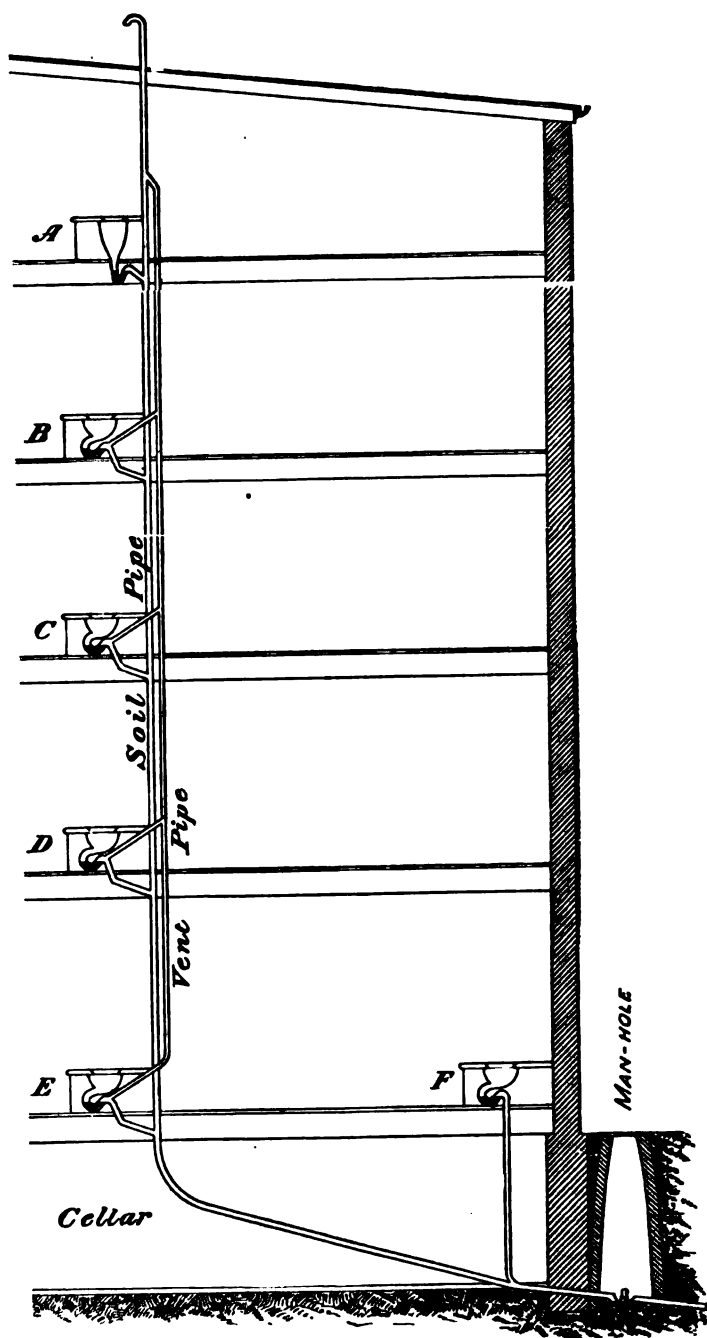


FIG. 87.

them through the roof independently. Where they pass through the roof they must be enlarged to pipes of 4 inches diameter, as they might otherwise be obstructed by ice in winter time. They should not be covered at the top with any kind of ventilator. The size of the vent pipe should never be less than that of the trap, except for water-closet traps, where it should be 2 inches in diameter, but in the case of two or more water-closets it should be 3 inches and sometimes even larger from the point where the various vent pipes join.

I must here make mention of the apparent danger of these vent pipes on traps under tubs, sinks and bowls stopping up with soap-suds or grease, in which case they would cease to act properly. This might prove another reason against the use of such vent pipes, but, these vent pipes being a comparatively recent refinement of plumbing, little is yet known about this point.

#### EVAPORATION OF WATER IN TRAPS.

Nothing short of continuous use will prevent evaporation of the water in traps. A large dip is recommended for traps on waste pipes to guard against a rapid loss of the seal. The vent pipe on traps will tend to increase this evaporation by the continuous current of air through it. When a house will be left unoccupied for a long time, but especially during the hot summer months special precautions should be taken to prevent sewer gas from entering the rooms and saturating carpets, wall-papers and furniture. Replacing the water in traps with oil or glycerine may be recommended.\*

#### ABSORPTION OF GASES BY THE WATER IN TRAPS.

It is well known that water has the property of absorbing gases, and it was believed that the water in traps would readily absorb sewer air from the soil pipe and give it off at the house side of the trap by evaporation. It has also been asserted that microscopic organisms (germs of disease) floating in gases of decay would pass through the dip of the water-seal and enter the house through the fixtures, and that consequently the water-seal of traps offered no security against the invasion of sewer gas. Dr. Fergus, of Glasgow, England, was the first to call attention to this matter, and made an extensive series of experiments in 1873-74, which led him to condemn as unsafe the system of water carriage in general, and the trapping of fixtures. The views of sanitarians, based upon Dr. Fergus' experiments, have been much modified by recent experiments of Dr. Carmichael, of Glasgow, by researches of Dr. Frankland in London, Wernich and Naegeli in Germany, Prof. Rafael Pumpelly and Prof. Smyth in Newport, R. I., and others.

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\*See article in *American Architect*, 1880, on "How to leave plumbing for the summer."

Dr. Fergus' experiments were made with gases in a concentrated condition, and as such are quite as reliable as the more recent experiments. But the latter more closely resemble actual cases, being made by experimenting directly with soil pipe gases. Referring to what has been said (page 258) about sewer gas, it will be seen that ammonia, sulphuretted hydrogen and other gases of decay are present in drains and soil pipes only in minute quantities. Dr. Carmichael found that the amount of these gases passing through a water-seal trap was so extremely small that no danger could be apprehended. With a thoroughly ventilated system of soil and waste pipes this peril may be taken as insignificant.

Another set of experiments by Dr. Carmichael, made to determine the passage of germs through water, seems to indicate that germs, even if contained in the water of traps, are not liberated from it, as was hitherto supposed, unless the water is violently agitated. Frankland in England, Naegeli in Germany and Prof. Pumpelly in Newport, R. I., arrived at the same conclusion, after careful investigations and experiments.

Dr. Carmichael sums up his conclusions by saying: "Water-traps are, therefore, for the purpose for which they are employed, that is, for the exclusion from houses of injurious substances contained in the soil pipe, perfectly trustworthy. They exclude the soil pipe atmosphere to such an extent that what escapes through the water is so little in amount, and so purified by filtration, as to be perfectly harmless; and they exclude entirely all germs and particles, including, without doubt, the specific germs or contagia of disease. . . ." Further scientific researches will undoubtedly throw more light on this yet little investigated subject.

#### TRAPS FORCED BY BACK PRESSURE.

On page 280 it was explained how traps under fixtures may be forced by back pressure. This cannot, however, occur with traps under fixtures, if all soil pipes and waste pipes are properly extended through the roof, and provided with a fresh air inlet at the foot of soil pipes.

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If all the above given rules are carefully observed, the system of drainage of a dwelling will be as perfectly as possible in accordance with the present knowledge of sanitary science. Time and experience

may find out hitherto unknown faults, but will also, it is believed, teach the proper remedy. With pipes of proper material, properly joined, properly laid, and properly and sufficiently often flushed with air and water, the object of a system of house drainage seems to be attained, viz.: the instant removal from the house of all liquid and semi-liquid waste matter,

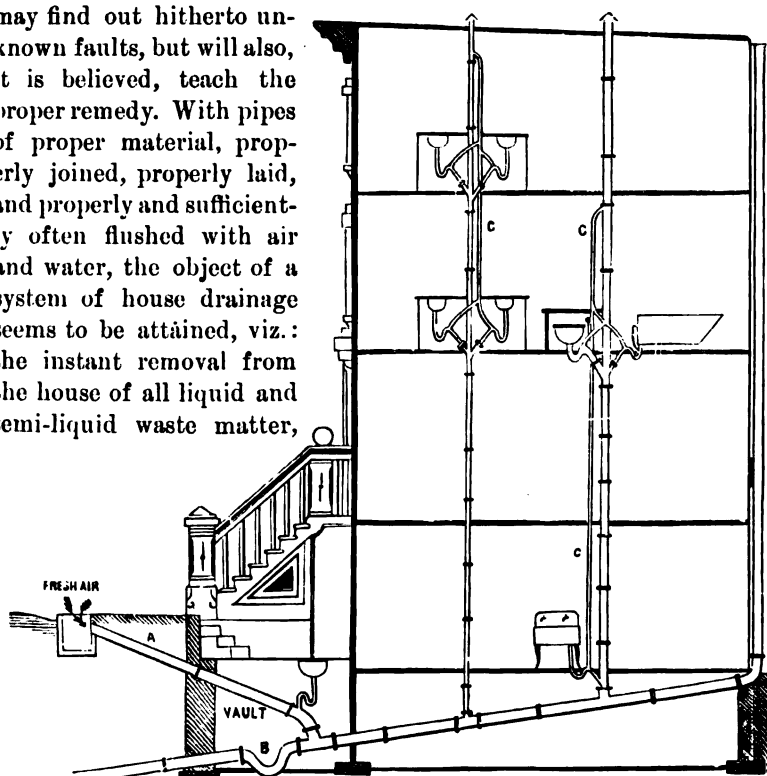


FIG. 38.

and the perfect oxydation and constant dilution of the air contained in the pipes.

Says Mr. J. C. Bayles\*: "The conclusion I have reached is that when sewer gas finds its way into a house through the soil and waste pipes, the fault lies somewhere between the architect, the builder and the plumber. In any case it is without excuse. I know that houses can be drained into sewers—without bringing sewer gas into them. The existence of foul sewers is in itself a perpetual danger to the public health, but there is no reason why we should bring that danger into our houses by providing channels through which the poisonous air of the sewer can find a means of ingress. I know of houses into which no sewer gas ever comes—unless, possibly, through the windows, borne in with the air of the street—and I have no hesitation in saying that, when the tenants of houses demand immunity from the dangers of unhealthful conditions, architects and builders will find a means of correcting the evils now complained of

\*J. C. Bayles, House drainage and water service.



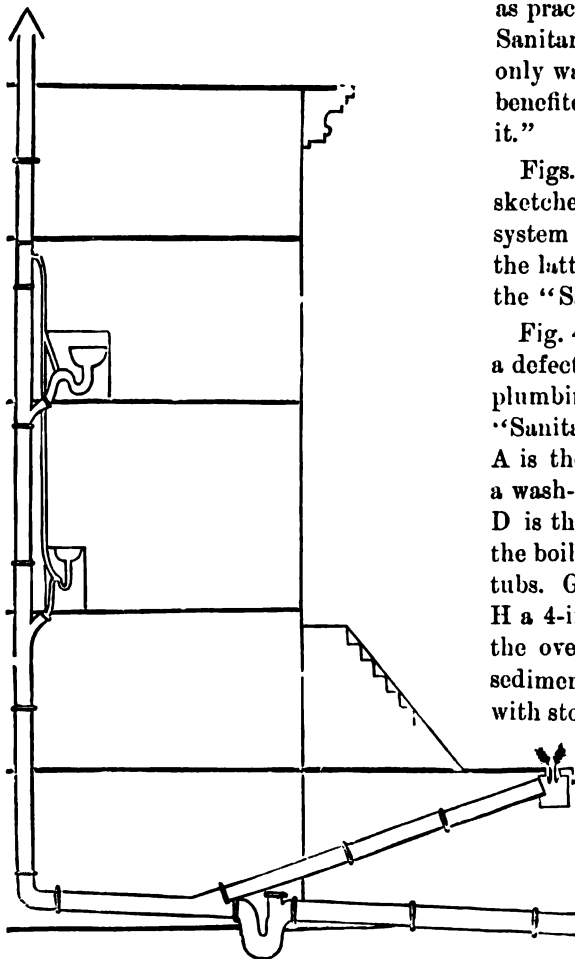


FIG. 39.

as practically irremediable. Sanitary reform in cities only waits until those to be benefited by it shall demand it."

Figs. 4, 38 and 39 are sketches of a well devised system of house drainage, the latter two proposed by the "Sanitary Engineer."

Fig. 40 shows a sketch of a defective arrangement of plumbing, taken from the "Sanitary Engineer," Vol. I. A is the supply tank, B is a wash-basin, C a bath-tub; D is the water-closet; E is the boiler, FF are the wash-tubs. G is the kitchen sink, H a 4-inch soil pipe. *a* is the overflow pipe, *b* is the sediment pipe of the tank, with stopcock; 1 is the trap of the water-closet, 2 is the trap of the kitchen sink.

The defects are as follows: 1. The soil pipe is not extended full size through the roof, is not trapped where

it goes to cesspool, and has no fresh air pipe.

2. The wash-bowl, bath-tub and the wash-tubs have no separate traps, but deliver into the trap of the water-closet and of the kitchen sink respectively.

3. The soil pipe not being extended, these traps will be siphoned, as they have no air vent.

4. The overflow from tank is connected to the soil pipe; it is trapped, but the water of the trap will soon evaporate, and the soil pipe air will taint the water in the tank.

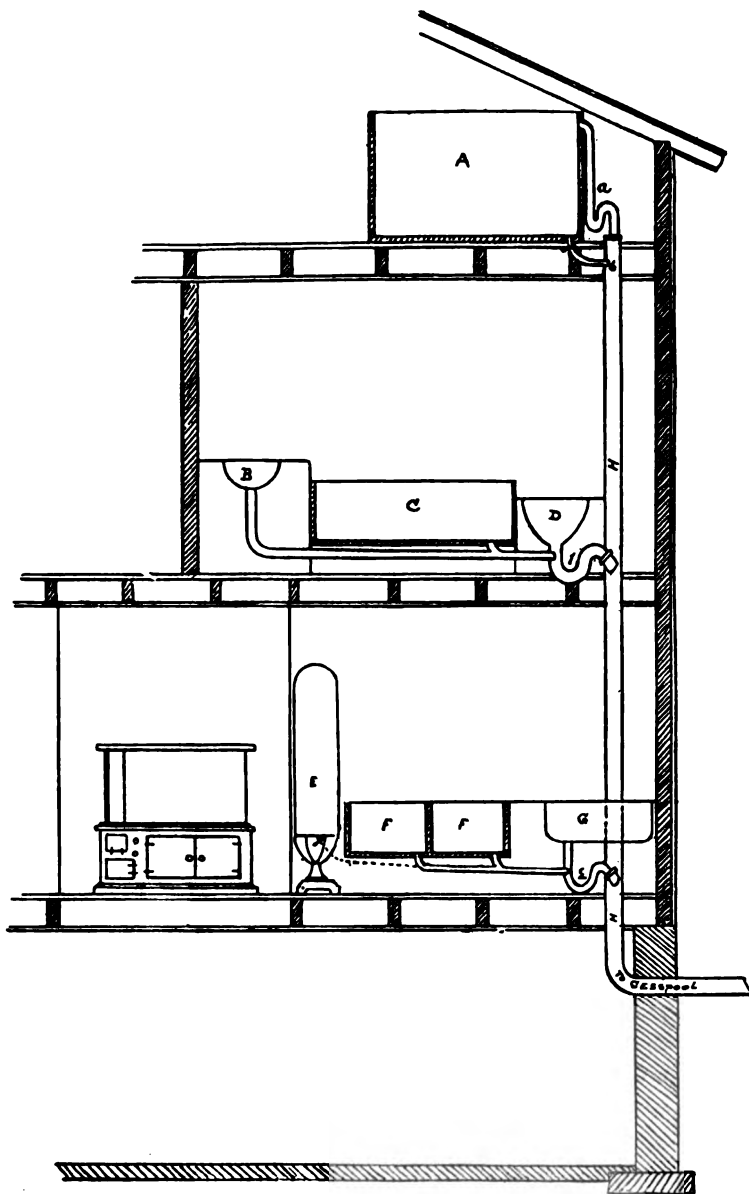


FIG. 40.

5. The blow-off from the tank is in communication with the soil pipe.



FIG. 41.

Fig. 41 illustrates a most defective manner of trapping the house drain, by the so-called "cesspool trap." It requires no vivid imagination to see in how short a time this trap really becomes a *cesspool*.\*

#### RECORD AND PLAN OF DRAINAGE AND PLUMBING INSPECTION.

It cannot be too strongly recommended to every householder to keep for future reference, for cases of inspection or repairs and alterations, a complete plan of all the drain, soil and waste pipes in and outside of the house, a record of the depth of the drain, of the sizes and material of pipes, of the location of junctions, traps, fresh air pipes, access-pipes or cleaning Y's, of all fixtures on every floor, etc.

Such frequent inspections are by no means superfluous. In some cities "sanitary associations" have been organized, such as at Newport, R. I., Lynn, Mass., and other places. The members of these associations can avail themselves of the services of an inspector of plumbing, employed by the association, in order to assure themselves by frequent inspections of the sanitary condition of the plumbing in the house, of its outside drainage and water supply, its ventilation, etc.

In the case of new buildings the architect's plans should show the exact location of the proposed plumbing work in the house. The work should be done according to written specifications, carefully drawn up by the architect or a sanitary engineer, under whose immediate direction the plumber should work. It is a mistake—but, alas! how often is it made—to give the plumbing work of a new building out by contract. The slight amount saved in first expense is almost always followed by an increased outlay for repairing and altering defects, which appear only after the house is occupied. A prudent house owner will prefer to have his plumbing done by day labor, by honest, conscientious plumbers—and these are by no means rare, as the universal cry against them would seem to indicate,—who care more about their reputation than about a few dollars earned through dishonest and reckless work.

\*It seems impossible, without exceeding the limits of this paper, to point out even the most frequent defects in house drainage. For an interesting account of these I refer the reader to

T. Pridgin Teale, dangers to health, a pictorial guide to domestic sanitary defects, 70 plates, 3d edition, Philadelphia.

See also: Col. Geo. E. Waring, Jr., the sanitary condition of New York City, in Scribner's Magazine for May, 1881, pages 73-75; 7th annual report of the State Board of Health of Massachusetts. Defects in House Drainage and their remedies, by Edw. S. Philbrick, C. E.: 10th annual report of the Massachusetts State Board of Health; Common defects in house drains, by Elliot C. Clarke, C. E.; Dr. John Simon's admirable book, "Filtz Diseases and their Prevention," American edition, paragraphs 14-20, 30-32; and the "Sanitary Engineer," vol. 1-5.

## PLUMBING REGULATIONS.

The cities of New York, Brooklyn and Washington lately have set an example worthy of imitation in other cities. The health authorities have issued excellent regulations for plumbing of buildings, and require the plans for plumbing to be submitted to them for approval and for filing. The plumbing, before being covered up, is examined by intelligent inspectors of the Board of Health. There may be at first some bad feeling about such a measure, but the good plumber will soon understand that the law passed is to his advantage: it will protect him against "botches" in the trade, and will help to reëstablish his of late much abused good name.

These plumbing regulations will certainly tend to lessen the frequent complaint about bad plumbing in houses, and the consequent entrance of sewer gas. They will contribute much towards the lowering of a high death rate, and similar regulations may be adopted with advantage in all large cities.

## PLUMBING FIXTURES.\*

I will now consider the selection of proper plumbing fixtures. Of these I shall briefly discuss wash-basins, baths and foot-tubs, laundry tubs, kitchen and pantry sinks, greasetraps, housemaid's sinks, slop sinks, urinals, water-closets and flush tanks; also tanks, cisterns and refrigerators, so far as they are connected with the drainage of the dwelling. It may be well to say here that the fixtures in a house should be so concentrated as to render necessary as few vertical stacks of soil or waste pipes as possible, and also to avoid long, horizontal runs of soil and waste pipes, which are objectionable inside floors, first, because they often necessitate the cutting of beams, and second, because they exclude the possibility of laying the soil and waste pipes with a sufficient pitch. Much may be effected in planning a new building, in this direction, by a proper attention of architects to its drainage system.

In regard to proper sizes of waste pipes and traps for fixtures see page 295. In all cases place the traps for fixtures as near to them as possible.

## WASH-BASINS.

Beginning with wash-basins little of sanitary importance may be said with regard to them. If properly fitted with waste pipes of

\*This review of plumbing fixtures is written from a sanitary point of view only; for a more detailed technical description I must refer the reader to an interesting series of articles on "Modern Plumbing," by T. M. <sup>1</sup> in the "American Architect," for 1878; and to the papers on "Plumbing Practice" <sup>2</sup> Engineer."

proper size and material, and efficiently protected by a good trap, they

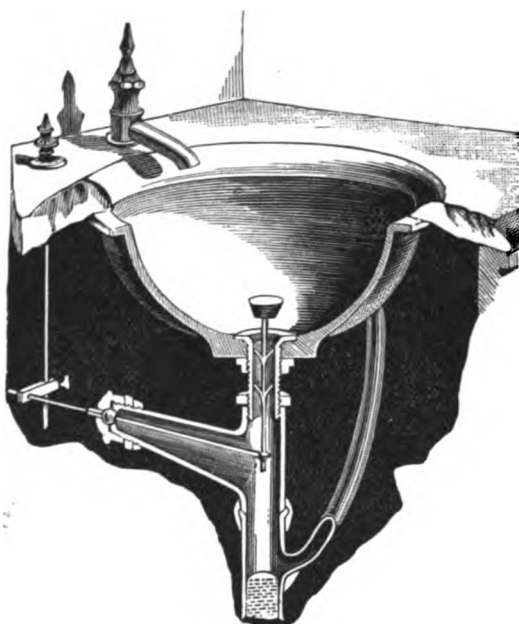


FIG. 42.

may be considered perfectly safe conveniences in dressing-rooms. I would, however, discourage their use in sleeping apartments, as the human system seems to be more susceptible to the influence of sewer gas at periods of rest. The material of which wash-basins are made, is either galvanized or enamelled iron, or else earthen ware, the latter being much the best. The common chain and plug arrangement of wash-bowls is objectionable, as it is liable to become unclean with soap-suds. A good device for emptying a bowl is what is known as "Weaver's waste" (Fig. 42.) By simply touching a knob, connected to a lever, the stopper

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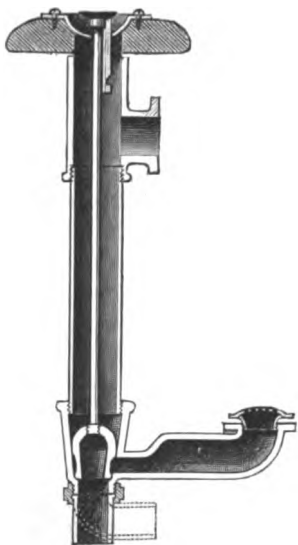


FIG. 43.

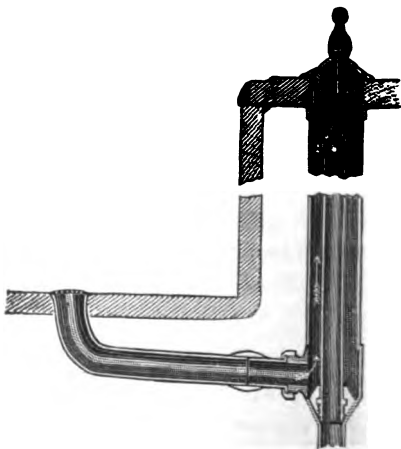


FIG. 44.

in the bottom of the bowl is lifted and held in place. Thus the bowl is emptied without the necessity of putting the hands into the dirty water.\*

McFarland's waste, (Fig. 43,†) is a similar good contrivance, but the arrangement shown in Fig. 44,‡ known as Foley's valve seems objectionable, as it leaves the valve chamber in connection with the bowl, and thus, after emptying the bowl, the chamber remains fouled with soap-suds and deposit, which will mingle with the clean water at the next use of the wash bowl. Jennings's "tip up basins" also do away with chain and plug, and the basin is emptied by tilting it, thus discharging its contents into a bowl underneath which is concentric with the upper basin, and to which the trapped waste is attached. It appears at first sight to be a cleanly device; but it gradually accumulates foulness in the lower basin, which receives no special cleansing, and for this reason these tip up basins are not to be recommended.

If a waste from a wash-bowl is near a soil pipe, it should be made to enter it independently by a 4 x 2 inch Y branch; in no case should it empty into a water-closet trap below the water line. The waste having then only a slight fall from the bowl to the trap, the water of the latter, which frequently holds excremental matter, will stand for a long distance back in the horizontal waste pipe, and keep it continually foul (Fig. 45); the free flow from the bowl is much retarded,

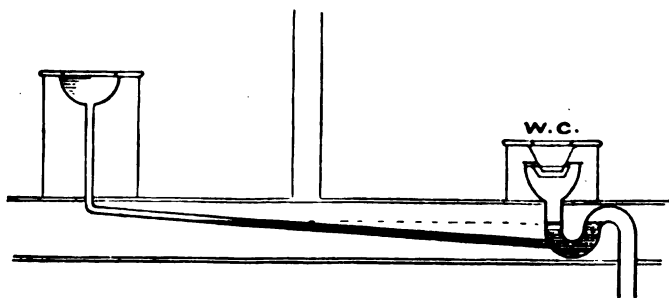


FIG. 45.

and when the waste from bowl has a trap, the pipe between both traps will be air bound. When the wastes from wash-bowls and bath-tubs are not trapped separately but enter the water-closet trap below its water line, which thus is intended to trap both fixtures, the foul water of the water-closet trap may readily evaporate into the room. Moreover, it frequently happens that this trap may become displaced

\*How disagreeable and contrary to the feelings of cleanliness it is to have to remove a plug detached from its chain from a bowl, used by some unknown person before us, in a public place, hotel, etc.

†The illustrations show McFarland's and Foley's wastes for bath-tubs; the fittings for wash-bowls are very similar.

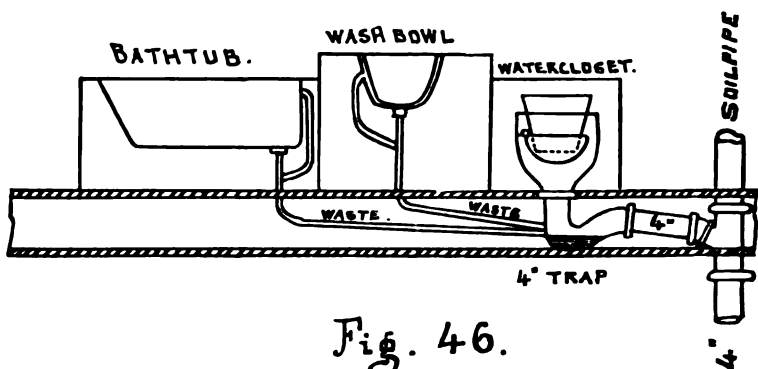


Fig. 46.

so as to render the water-seal, which is usually only a little over an inch in depth, ineffective (Fig. 46.) It will be readily understood how, under such circumstances the foul gases of the soil pipe—especially if this be unventilated—gain an easy access into our rooms. Should the main drain have an untrapped connection to a sewer or cesspool, the gases from these would ascend and permeate the whole building. Such instances of faulty work are by no means rare, and are the causes of much preventable headache and sickness.

#### BATH-TUBS.

These are made either of heavy copper, tinned and planished, or of

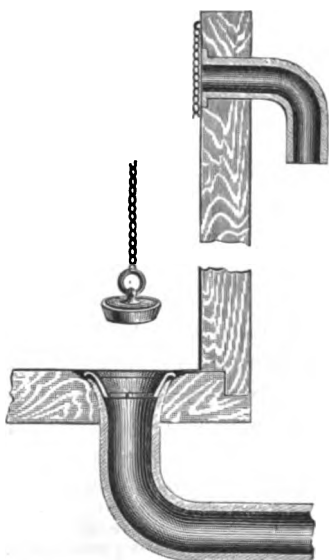


FIG. 47.

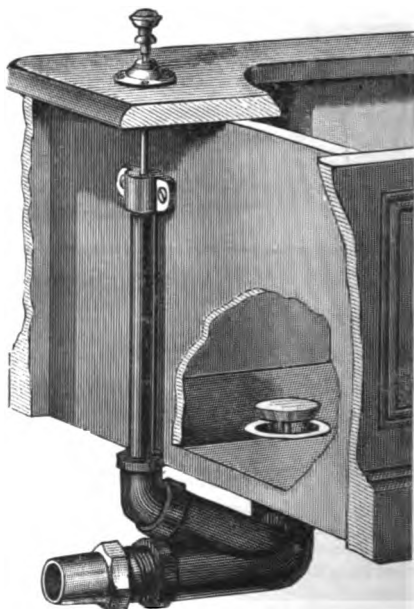


FIG. 47. a.

cast iron with a porcelain enamel, or of stone ware. Any of these may be used, the selection depending merely upon their cost. Much of what has been said about wash bowl wastes is equally applicable to bath-tub wastes. They should never enter the trap of a water-closet below its water line, but should be separately trapped. Each bath should be provided with a proper overflow waste, and this should invariably enter the bath waste between the outlet of bath and the trap.\* The common arrangement of emptying a bath by chain and

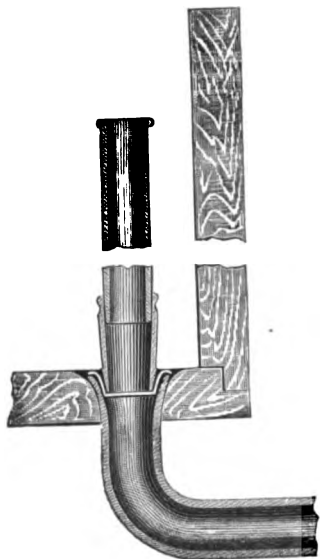


FIG. 48.

plug is shown in Fig. 47. Instead of this uncleanly device an improved bath waste is recommended, for instance Weaver's bath-tub waste (Fig. 47\*), McFarland's waste for bath-tubs (Fig. 43), or H. C. Meyer's improved bath waste. What is known as a "standing overflow," (Fig. 48), is a simple and cleanly contrivance for emptying baths, the only objection sometimes made against it being that it may be in the way when bathing. It renders a special overflow pipe unnecessary.

The many varieties of tubs used for personal cleanliness, such as foot-tubs, sitz-baths, shower-baths, bidets, etc., need no further explanation, as the principles for the sanitary construction of bath-tubs apply equally well to them.

#### LAUNDRY TUBS.

Laundry tubs are made of various materials such as wood, or wood lined with sheet-lead, enamelled or galvanized iron, cement stone, soap-stone or earthen-ware. Wooden tubs are objectionable as this material readily absorbs the dirty water and becomes foul, emitting a close odor when not in use. Being alternately wet and dry they are liable to leak and will quickly rot. Cement stone laundry tubs are cheap, durable and cleanly. They have no seams, each tub being manufactured in one piece, and therefore will not leak. Galvanized or enamelled iron and soap-stone trays are equally good and much in use. The white crockery or "ceramic" tubs are undoubtedly the neatest, and are always perfectly clean and sweet. They are not subject to wear or leakage, nor do they absorb dirty water, and therefore do not become foul from use. They are, of course, more expensive than any of the others. The outlet pipes from a set of laundry tubs

\*This will also apply to the overflow from wash-bowls, sinks and tubs.



should join, and have beyond the last pipe one common trap of proper size—either a suitable mechanical trap or an S trap, with proper vent pipe, in cases where siphonage is likely to occur.

#### KITCHEN AND PANTRY SINKS, LAUNDRY AND HOUSEMAID'S SINKS.

These sinks are made either of wood, lined with lead or with copper, or of cast-iron, which may be galvanized or enamelled; of copper, soap-stone, slate or earthen-ware.

For pantry sinks tinned and planished copper is generally used, being preferable to porcelain or soap-stone sinks, as glass and crockery is not as liable to breakage in them.

For kitchen and laundry sinks soap-stone or iron is recommended. Galvanizing or enamelling the iron much improves the appearance of the sinks. Housemaid's sinks, used only to draw water, may be of small size and look most cleanly when manufactured in earthenware, although other materials are equally good.

Sinks are, as a rule, encased in tight wood-work, and consequently a close, damp and foul smell is often noticeable in the compartments under the sink. This method of fitting up sinks is decidedly objectionable. The space underneath should be free to light and ventilation, and readily accessible for frequent cleansing. To use an unventilated, closed space under a kitchen sink for the storage of kitchen utensils is a practice which should be strongly condemned.

Sinks should either be supported by brackets properly fastened to the walls, or else they should rest on legs. The floor under the sink and the wall back of the sink may be laid in white Minton tiles, which makes a neat and most cleanly arrangement.

Sinks should be provided with strong, metallic strainers, either open or plug strainers. In both cases the strainer should be securely fastened to the sink so as *not to be removable* by servants, in order to prevent obstructions of the waste pipe. It is important that sinks with plugs\* should have an overflow-pipe of sufficient capacity to carry off the full supply, in case the supply cock should be accidentally left open.

#### GREASE TRAPS.

Through kitchen and pantry sinks a large amount of grease, derived from washing dishes, etc., is emptied into the drainage system. This grease proves to be of all the waste matters in the house the most difficult to deal with. Being dissolved by hot water it passes the strainer of the sink in a fluid condition, but soon becoming chilled it adheres to the sides of the waste pipes or drain, and lodges in the traps, unless properly taken care of.

---

\*This applies also to wash-bowls, bath-tubs, etc.

If the drain inside and outside of the house has a very good pitch, the grease will probably be carried far away from the house before becoming solid. This is more likely to happen where sinks have plugged outlets, as the rush of the water carries the grease very far. The ammonia of urine will remove grease, and thus pipes receiving above the point where the waste from the kitchen or pantry sink enters the cellar drain a water-closet or urinal discharge are often found to be comparatively free from grease.

But in large houses, or hotels, etc., the grease should not be allowed to enter the house drain at all; it should be intercepted by a proper grease trap, placed as near to the sink as the locality may permit. The grease trap may be placed either *within* the house, in the basement or directly underneath the sink, or else *outside* the house. The latter arrangement is much the best, provided the distance from the kitchen sink to the grease interceptor is not too great, otherwise the grease would congeal on its way to the interceptor. A circular tank made of bricks, laid in hydraulic cement, should be constructed of dimensions depending somewhat upon the size of the house (Fig. 49

and 49 a.) It should be large enough to allow the water time to cool. Its overflow pipe consists of a quarter bend, or better, of a T branch, (Fig. 49 a,) dipping at least six

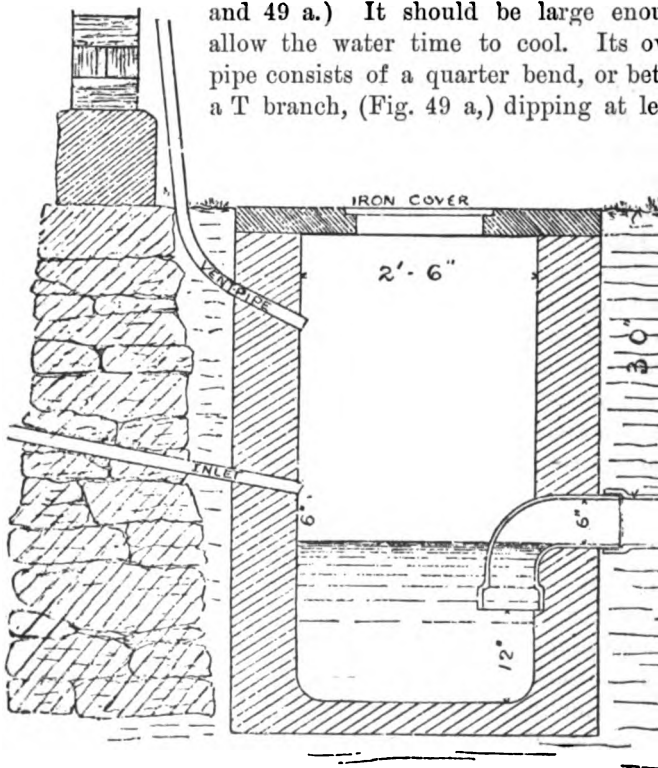


FIG. 49.

inches below the water line, in order not to disturb the grease in the intercepting tank. This grease trap should be frequently cleaned, and inspected. The grease, floating on top of the water, can easily

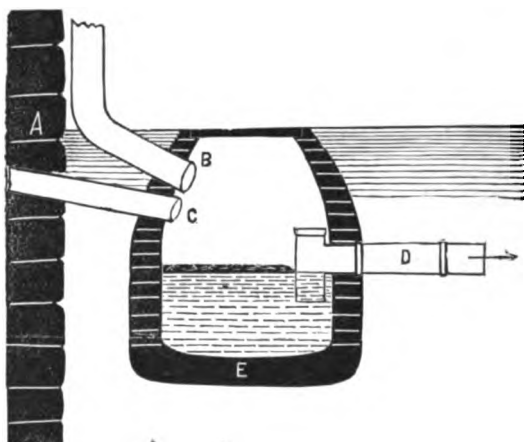


FIG. 49 a.

be removed. Efficient ventilation by a large vent pipe should be provided. Wastes from kitchen and pantry sinks only should discharge into the grease trap.

If inside of the house and in the basement, the grease trap may be made of earthenware, of wood lined with heavy lead, or of copper. But such a grease

trap in the basement cannot be recommended.

If directly under the sink it may be made of enamelled or galvanized iron, of copper or of crockery ware. What is known as Carson's sink has an iron receptacle for grease immediately below and attached to the sink. It is doubtful whether these tanks under sinks can be made of sufficient size, without becoming clumsy, to allow the grease to cool and congeal. Unless properly attended to—and the kitchen sink is liable not to be kept perfectly clean by the servants—grease traps inside of a house constitute, in my opinion, cesspools on a small scale, holding fatty waste matters which readily become putrid and offensive. If there is no convenient place for an outside grease trap, better use none at all and trust to the action of the alkalis to “cut” the grease in the pipes. A valuable cleansing agent for pipes, where the use of a grease trap is omitted, may be found in occasional flushing with hot solutions of common washing soda, or better, of potash.

#### SLOP SINKS AND SLOP HOPPERS.

We have hitherto considered only those fixtures which receive foul water unmixed with the discharges from the human system. Slop sinks and slop hoppers, as well as water-closets and urinals, intended to convey to the drain these foul discharges, are more liable to become foul outside and inside, unless carefully attended to.

Slop hoppers should be arranged on bed-room floors to enable servants to empty chamber-slops into them. They should be flushed at each discharge by a sufficient quantity of clean water, and this

flush is fully as necessary here as in the case of water-closets. Slop sinks should be made either of enamelled cast-iron or of earthen-ware. They should be provided with a fixed strainer at the outlet. The waste need not be larger than 2 inches in diameter and should be trapped by a suitable trap. If an S trap is used, it must be properly guarded against siphonage, which is very likely to occur when a pail of water is suddenly emptied into the sink. Instead of a sink, a combination of a sink and a conical-shaped, iron hopper, such as Merry's slop hoppersink, manufactured by the J. L. Mott Iron Works, is sometimes used, and, if provided with a strainer, it will answer very well. An earthen-ware bowl, with improved flushing rim on top of an iron or lead hopper, will make a cleanly device. If a water-closet is fitted up without any wood-work (except the seat), such as described on page 332, it may also serve the purpose of a slop sink. This would not be advisable in the case of a water-closet encased in wood-work, as the latter would readily become impregnated with the foul water, carelessly emptied and often spilled.

#### URINALS.

No fixture is so liable to become unclean and foul smelling as a urinal, owing to the rapid decomposition of the urine. A urinal requires a very large amount of flushing water; even then, a small amount of urine, spattered over, is apt to become very offensive. Swinging urinals and lipped urinals have been much used in modern houses, but I should certainly advise to do away with them entirely in private residences, as a properly constructed water-closet may safely take their place.

In public places, such as hotels, schools, railroad depots, places of amusement, etc., they, however, become a necessity. For these places three kinds of urinals are in use, viz.: the so-called "Bedfordshire" and lipped urinals, of enamelled iron, or better of earthenware,

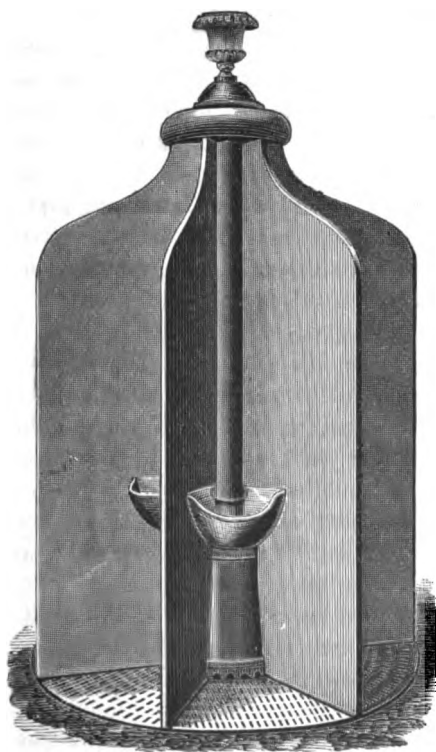


FIG. 50.

for the enamel soon scales off; of these a number may be placed and fastened along a wall, with partitions of wood, or preferably, slate between them. The second kind much in use are urinal troughs, made

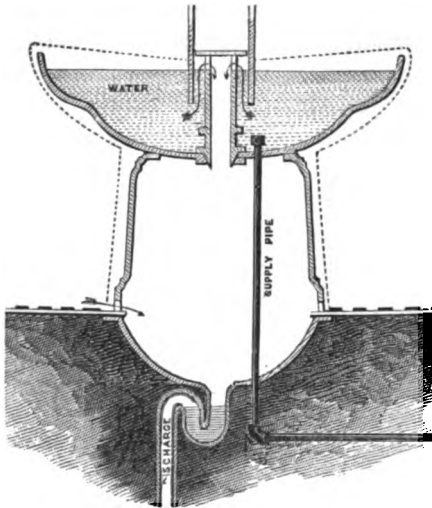


FIG. 50 a.

of wood lined with lead, or of galvanized or enamelled cast iron, or else of slate. Finally, for out-of-door location, round urinals are used, furnished with a large circular bowl, holding a body of water, and with a number of projecting lips, separated by suitable partitions. Fig. 50 and 50 a, illustrate such a urinal, manufactured by the J. L. Mott Iron Works, New York.

The material for urinals should be non-absorbent and should not easily corrode. A constant stream of water should trickle into a trough or bowl urinal, in order frequently to change the water in the latter, but also to secure an immediate and thorough dilution of the urine. Earthenware single urinals should be flushed either by a stop-cock, or better by some automatic arrangement, such as a suitable flush tank or tilting tank, (see page 337,) discharging at frequent intervals and completely flushing the urinal. Waste pipes from urinals need not be larger than  $1\frac{1}{2}$  in. or 2 in. diameter. The outlet of the urinal should be protected by a strainer, to prevent obstructions of the waste pipe. The ventilation of urinal apartments should receive special attention.

#### WATER-CLOSETS.

Water-closets should be in all houses that make any pretensions towards convenience. That they are a vast improvement over the old fashioned, offensive privy-vault in the back yard, everybody will acknowledge. But it is equally true that, unless of a good pattern, properly fitted up, cleanly used, carefully watched and frequently cleansed, they may become not only the sources of foul smell but also the cause of disease.

Leaving aside the question of the pollution of the soil and of well-waters, of which the privy-vault must sooner or later be the cause, it is in itself a nuisance and an abomination. In cold weather and during rain-storms persons are liable not to use it, when they ought to, and trouble of the digestive organs is sure to follow, as every

physician knows. This is especially the case with females and with delicate children. Sick persons and invalids may suffer severely from exposure to the weather. Add to this the often unbearable stench emanating in hot weather from such vaults, and it will be readily seen how superior in point of convenience, health and cleanliness an indoor water-closet is.

There are other improved devices for receiving fæcal matters, such as earth-closets, ash-closets, tubs or pails, which are far preferable to privies, and should be recommended wherever water is scarce; but these do not properly belong to the subject of this paper, which refers only to the "water carriage" system.

After reviewing the different patterns of water-closets in use we shall speak about the general arrangement of the water-closet apartment with respect to light and air.

There is an endless list of water-closets, and each year increases the number of newly invented and patented articles. It is, of course, impossible, nor even desirable, that my paper should give a complete description of all of them. I shall limit myself to describing the chief features of the various types of closets, illustrating each of them by a few examples.

The most important points to be considered with a water-closet are: the shape of the bowl or vessel receiving fæcal matters; the manner of discharging the contents of the bowl; the manner of flushing the bowl; the manner of trapping the water-closet; and the ventilation of the water-closet.

A water-closet should be separated from the drain or soil pipe by at least one efficient trap, *the contents of which should be thoroughly changed with each use of the closet.* It should have a *copious supply of water* completely to wash at each use the bowl and other surfaces, coming in contact with foul matters. Much will depend upon the manner of the flush. It is decidedly preferable to flush a water-closet from a special cistern, and not directly from the main supply pipe. Allowing the water to run continuously through a water-closet cannot be regarded as *flushing*. Two or three gallons properly applied at each use will cleanse a water-closet more thoroughly than an uninterrupted trickling flow of water. In order to be efficient *the flushing water should come down "in a sudden dash."* A flush introduced into the bowl in the direction of the tangent will whirl around its circumference, losing its force without effecting much cleansing. A fan flush, or a proper *flushing rim* all around the bowl are vast improvements. With a proper trap and a good flush, every water-closet judiciously used and well taken care of should be *inodorous*.

A further requirement is *simplicity of the working apparatus*. The less moving parts a water-closet has the better will it be. We

must bear in mind the rough usage to which such fixtures are sometimes subjected in public places. Delicate or complicated mechanisms will fail to work properly under children's or servants' hands.

The less *surface* a water-closet has *exposed to fouling*, the cleaner and better it will be. All foul matters should pass into water as quickly as possible. Thus the fouling of the sides of the bowl will be efficiently prevented, and the water will tend to deodorize the excrements. This is accomplished in all water-closets holding a large body of water in the bowl. In others, where the body of water is in the trap, this should be as near as possible to the bowl, and the rear side of the latter should be designed as straight as possible.

With these general principles in view, let us examine the different patterns, which may be divided into five distinct classes, viz.:

1. Pan closets.
2. Valve closets.
3. Plunger closets.
4. Hopper closets.
5. Washout closets.

#### 1. PAN CLOSETS.

To this class of closets belong the Philadelphia valve closet, the Bartholomew valve closets, and many others. The name "valve" closet is an improper one, and leads to confounding these closets with those of class 2. The name is derived from the manner of supplying the flushing water to the closet, by joining the supply pipe to a more or less slow shutting valve, worked by the pull or handle of the closet. These valves are mostly unreliable, wear out and leak, especially when subjected to varying pressure from the street main. The mode of flushing a water-closet from the main supply is decidedly objectionable, especially with closets located in upper stories of city houses. If water is drawn from a faucet in the basement, instead of water flowing out at the valve of the water-closet, air sometimes rushes in from the bowl. Thus the purity of the drinking water is endangered, while the water-closet often remains without a flush. Pan closets may, however, be flushed by a special cistern with lever arrangement, and therefore the above serious defect is not one characteristic to these kind of closets.

The real defects of the pan closets will be at once apparent by inspection of Fig. 51. The excrements are received in a bowl, closed at the bottom by a copper pan, holding a few inches of water and

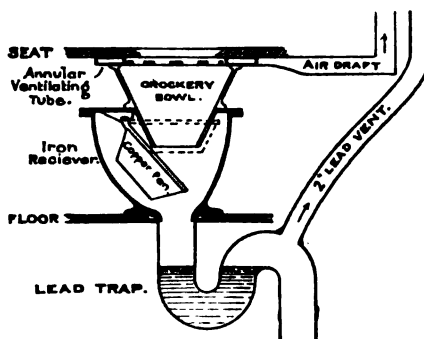


FIG. 51.

not uncommon to find in old houses a D trap under the water-closet, a second "container" of foul matters. The foulest part of the pan closet is the receiver, for the solids gradually accumulate on its sides, as these receive no washing from the flush. The filth soon undergoes decomposition, and the resulting gases, having been confined by the double water-seal of the pan and the trap, are expelled into the apartment at each use of the closet. They also frequently find an exit at the hole, through which the spindle, tilting the pan, passes. And finally the putty joint between bowl and receiver may become untight and afford means for the passage of sewer gas. The flush is insufficient in most pan closets to clean the bowl; it certainly loses all its force before reaching the container, foulness accumulates here and excremental matter lodges in the trap, as the flush is not strong enough to drive it out through the dip or water-seal.

Some of the enumerated defects may be remedied: by enamelling the inside of the cast-iron receiver; by ventilating it by an inlet pipe for fresh air and a vent-pipe; by having special flushing arrangements for the container; by using a bowl with an improved flushing rim or a fan spray, the water for the flush being derived from a special tank. But by all these costly improvements the *only* merit of the pan closet, its cheapness, is annihilated, and a better water-closet may as well be used. As long as a house is fitted with pan closets, of whatever pattern, it may be said not to have reached the standard of safety from a sanitary point of view.

## 2. VALVE CLOSETS.

To this class belong the following water-closets: Hellyer's improved valve closet (Fig. 52), Demarest's Acme closet (Fig. 53), Curr's Defiance water-closet (Fig. 54), the Lambeth valve closet, the Lambeth trapless closet (Fig. 55), Bean's valve closet (Fig. 56), the three latter English specimens, and many others.



The valve closets are certainly a vast improvement upon the pan closet. Instead of being closed by a pan, the bottom of the bowl is closed by a flap-valve, from which the closet takes its name. This valve is tightly held in place by a counter-weight on a lever to which the pull is attached. By lifting the pull the valve, which is hinged, is turned downward, and allows the contents of the bowl to drop into the trap. The container is much smaller than in the case of pan-closets. It generally has a ventilating pipe to remove foul gases. The bowl holds a large quantity of water into which the solids are dropped and instantly deodorized. It is provided, with some of the best closets of this type, with a superior flushing rim, and is flushed by a special cistern (Fig. 52 and 53.) As the flap closes tightly against the bottom of the bowl this must be provided with an overflow, which should have a

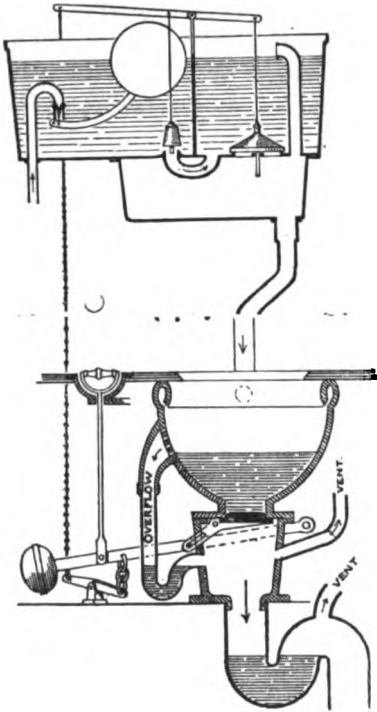


FIG. 52.

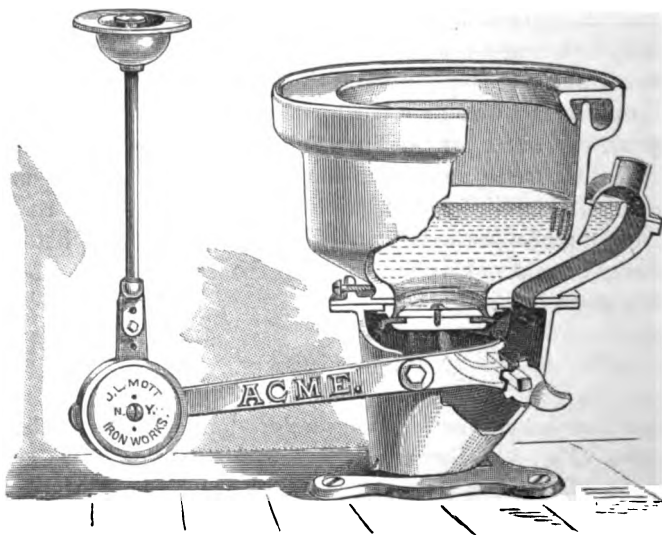


FIG. 53.

trapped connection to the container. Unless some water is furnished to this trap at each flush the trap is liable to lose its seal by evaporation, thus establishing a direct connection between the container

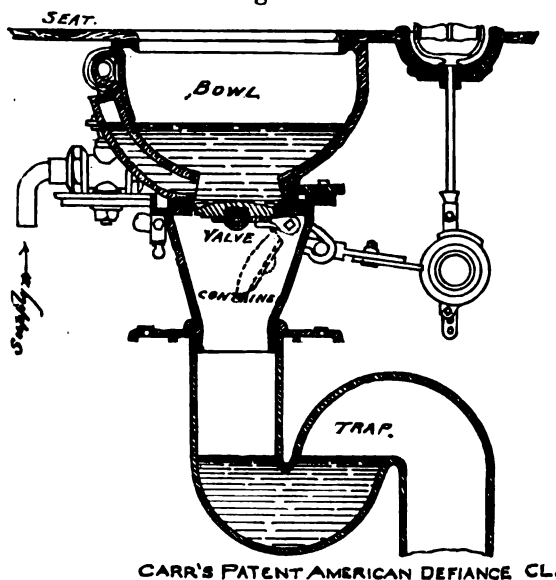
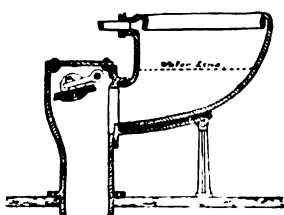


FIG. 54.

with the pan-closet. If such closets are flushed from a valve the solids will be driven out of the lead trap only after repeated flushing. Better closets of this class (Hellyer, Acme,) have suitably arranged cisterns, which deliver quickly a large body of water through improved flushing rims, and thus the danger from foul matter being retained in the trap is much reduced. After continued use the flap-valve is liable to leak; excrements or paper may stick to it and prevent its tight closing. The water will leak out of the bowl and the advantage of a double trapping is consequently lost.

The Lambeth trapless closet and the Bean closet (Figs. 55 and 56)

Fig. 55.  
Lambeth "Trapless" closet.

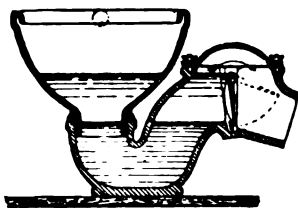


are different from the closets just described. The outlet of their bowl is closed by a flap, hinged to pivot and lever and held in place by a counter weight, but placed vertically against the outlet of the bowl. Such valves may be less liable to be fouled with solid matters and may close more tightly on this account. The water rushing out of the bowl in a large body will effectually flush the outlet of closet and trap.

The Lambeth closet, in order to avoid any accumulation of solids in the trap, does away with it altogether,

*Fig. 56*

*Beck's Valve-Closet*



but I do not consider this a safe arrangement, and would much prefer dispensing with the additional water-seal in the bowl than with the trap underneath the closet. For should the mechanism of such a flap-valve get out of order the house would be entirely open to the invasion of sewer gas from the soil pipe.

### 3. PLUNGER CLOSETS.

Among closets of this type I mention the Jennings' closets (Figs. 57 and 58), the Demarest closet (Fig. 59), the "Hygeia" (Fig. 59a), the Zane closet (Fig. 60), Moore's closet, Pearson's Twin Basin closet, Myers' Gale closet, Myers' China closet, the California "Perfection" closet, and others.

The characteristic detail of all these is the plunger closing the outlet of the bowl, which is mostly placed at the side of the closet.

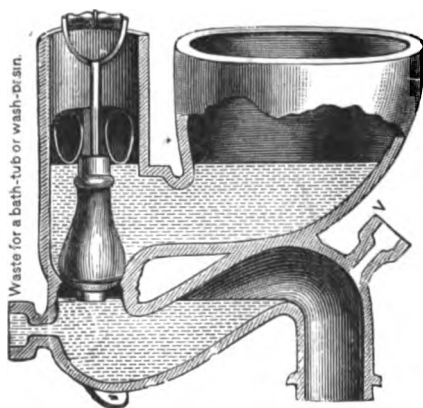


FIG. 57.

The foul matters drop into a large body of water in the bowl, are therefore partly deodorized and easily removed from the bowl. By lifting the plunger the contents of the bowl are rapidly discharged into the soil pipe, and the rush of the water, leaving the bowl, is so great as effectually to drive all matters through the dip of the trap. The latter must be efficiently protected against siphonage, which is more likely to occur with plunger closets

than with the pan, valve or hopper closets. The danger with closets of this class lies in the fouling of the plunger chamber. Waste matters and paper may stick to the seat of the plunger or to its sides; the outlet will then be imperfectly closed, allowing the water to leak out of the bowl. Closets having a small plunger chamber are the better ones, not only because they will be cleaner, but because with large chambers the waste of water must necessarily be large. In this regard the Hygeia closet (Fig. 59 a) is probably superior to all plunger closets heretofore made; it is flushed by a special cistern and requires no supply valve nor float in the plunger chamber.

In some plunger closets (Gale closet, China closet) a special spray arrangement is intended to wash the sides of the plunger and its chamber at each use of the closet, but, while it may be efficient, it tends to complicate the closet. The better closets of this class provide the top of the bowl with an improved flushing rim (Hygieia closet, China closet), or wash the sides of the bowl by an effective fan or water-spreader (Demarest closet). In order to provide

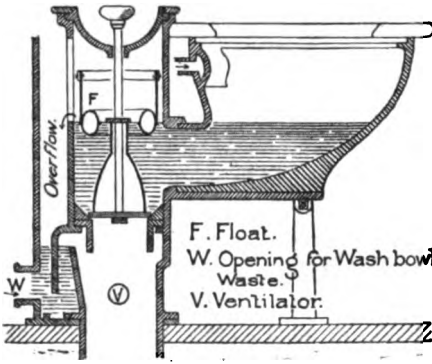


FIG. 58.

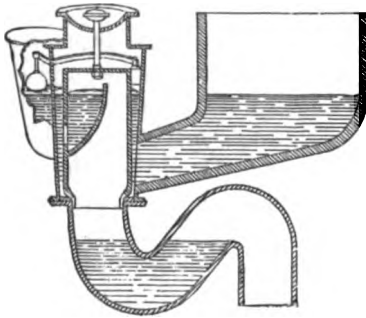


FIG. 59.

for an overflow the plunger is sometimes made hollow (Figs. 59 and 59 a), and when trapped it is so arranged that the water forming a seal is renewed at each flush (Fig. 59.) Otherwise it is liable to evaporate and this is especially dangerous with plunger closets that are trapless. In some closets an independent overflow is arranged (Fig. 58). Most of these closets are flushed by a valve,

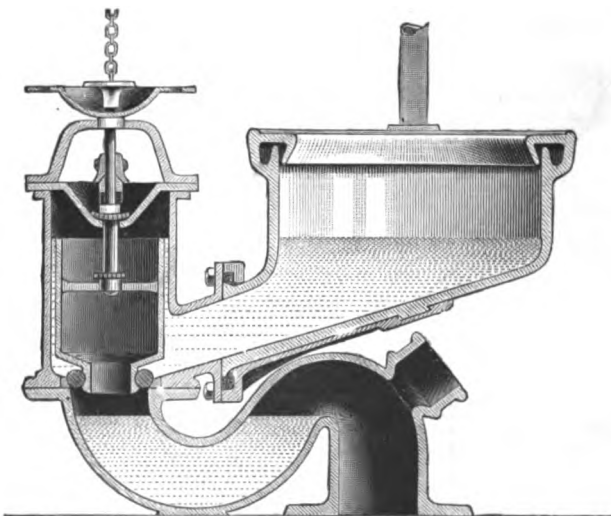


FIG. 59 a.

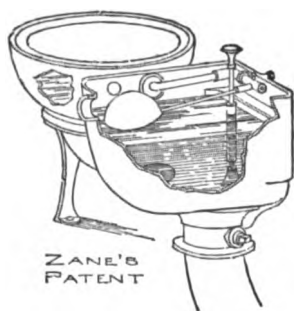


FIG. 60.



worked by a float in the plunger chamber. These valves are not always reliable, especially under varying pressures, and it is much better to flush these closets from a special cistern, as is sometimes done with the Demarest and Jennings' Closet, also with J. L. Mott's "Hygeia" closet (Fig. 59 a.)

#### 4. HOPPER CLOSETS.

There are many varieties of hoppers, made of either iron or of earthenware. The latter are much preferable; and the former should never be used unless well enamelled inside. Hoppers (Fig. 61) are sometimes liable to become soiled at the sides of the bowl, and for this reason have not become favorites with many. The hopper lacks the advantage of the pan, valve and plunger closets, in which the excrements drop immediately into a more or less large body of water, and thus carried in suspension by the water, are easily removed from the bowl by

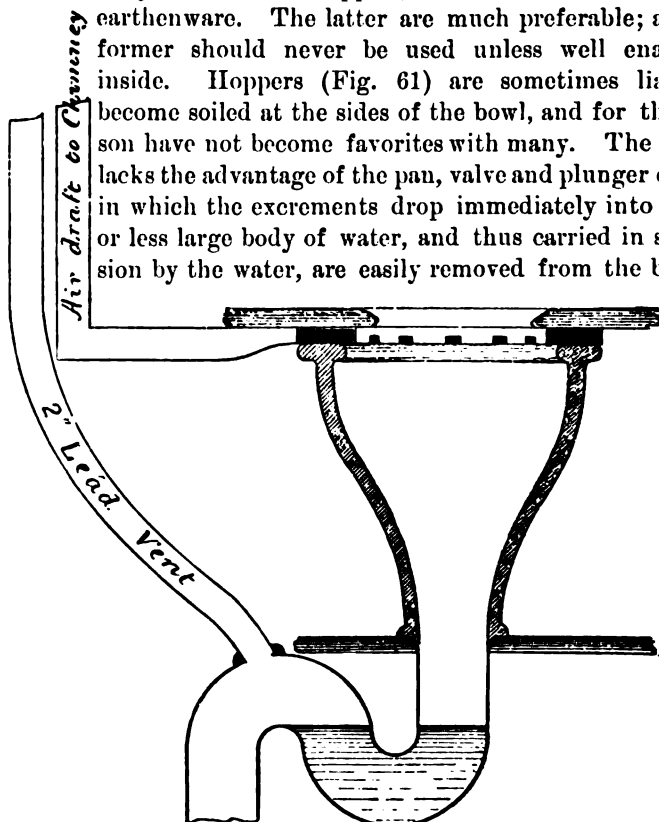


FIG. 61.

tilting the pan or valve, or by lifting the plunger. A good practice

is to wet the sides of the hopper before use, and where the hopper is flushed by a special cistern such a device has been arranged to work automatically. The rear part of a hopper should be vertical and straight so that matters will drop immediately into the water of the trap without touching the sides of the hopper. The inside of hoppers should be very smooth, and for this reason earthenware is much preferred to enamelled iron, because the enamel scales off gradually. In order to have as little surface as possible exposed to fouling, the sides of the hopper should be short, which is in some accomplished by having the trap above the floor (see Figs. 62 and 66). The apparent greater cleanliness of the pan, valve or plunger closets is simply a delusion. It is true, the hopper will sometimes have its sides soiled with excrementitious matter, when the supply or the manner of flush is inadequate. But the defect is in sight; it shows itself to the person using or in care of the closet, and it can easily

FIG. 62.

be remedied by proper occasional application of hot water, soap and a scrubbing-brush. Not so with the other closets. The dirty matter may be out of sight, but it often remains, hidden from view, in those parts of the closet

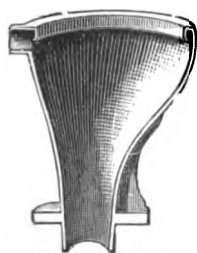


FIG. 63.

which are not easily accessible and therefore never cleaned or inspected until a leakage occurs, or until some foul odor compels the householder to call for the plumber.

The great merit of hoppers lies in their simplicity and in the total absence of any mechanical parts, which

automatically. The rear part of a hopper should be vertical and straight so that matters will drop immediately into the water of the trap without touching the sides of the hopper. The inside of hoppers should be very smooth, and for this reason earthenware is much preferred to enamelled iron, because the enamel scales off gradually. In order to have as little surface as possible exposed to fouling, the sides of the hopper should be short, which is in some accomplished by having the trap above the floor (see Figs. 62 and 66). The apparent greater cleanliness of the pan, valve or plunger closets is simply a delusion. It is true, the hopper will sometimes have its sides soiled with excrementitious matter, when the supply or the manner of flush is inadequate. But the defect is in sight; it shows itself to the person using or in care of the closet, and it can easily

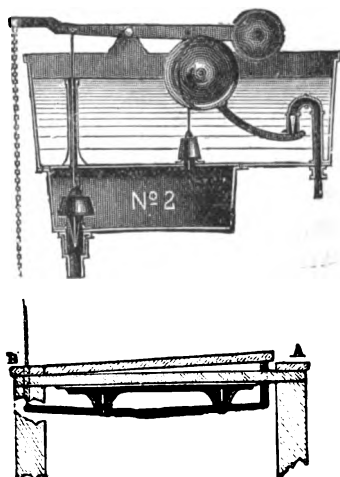


FIG. 64.

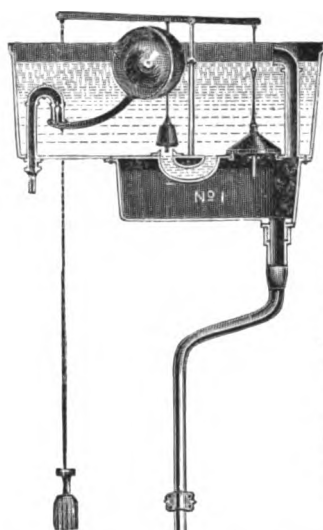
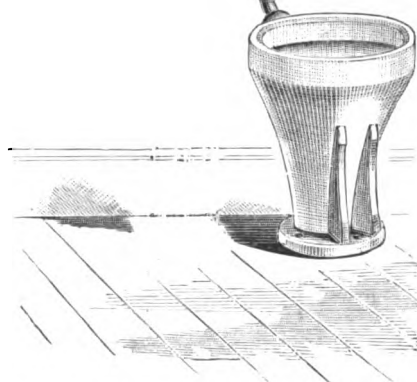


FIG. 65.



sooner or later, fail to work properly, especially when the closet is carelessly used. Much depends with a hopper-closet upon the flush. The practice of turning a stopcock and thus introducing a feeble stream into the hopper, which whirls around its inside, is objectionable. Hopper-closets should always be provided with *flushing cisterns* allowing a *bountiful supply* to rush vertically downward through a *large supply pipe* and a *well-shaped flushing rim*. Among the best hoppers, I mention Hellyer's long Artisan

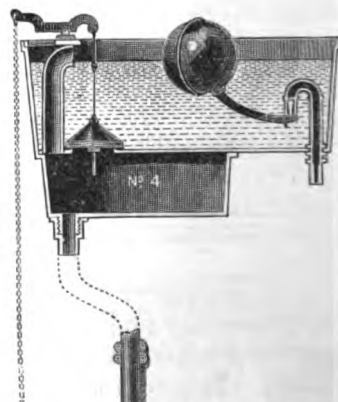
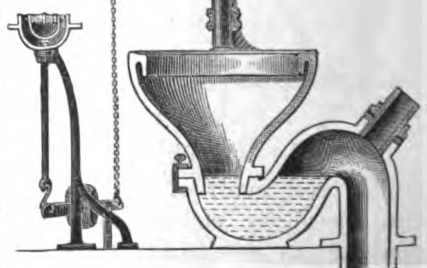
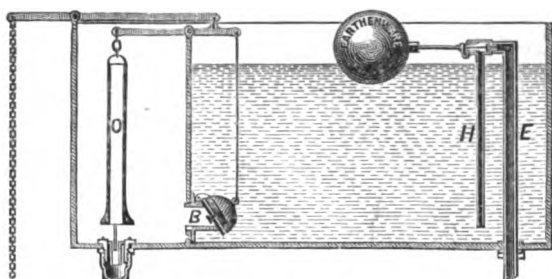


FIG. 66.

Hopper (Figs. 63 and 65), Hellyer's short Artisan Hopper (Figs. 62 and 66) having trap above the floor, A. G. Myers' Niagara Hopper (Fig. 68), Demarest's long and short earthen hoppers, Rhoads' hopper (Fig. 67), and others. Rhoads' porcelain seated hopper is a cleanly device for hospitals, schools, factories, railroad



depots, public buildings, etc., provided it is well flushed, and only where the apartment can be well heated in winter, as otherwise, the seat being



cold, the closet is liable to be improperly used. The Niagara Hopper, provided with a wooden rim for a seat, attached directly to the bowl (Fig. 69), will answer better than Rhoad's hopper in exposed places, the only objection being the possible absorption of urine through the wood.

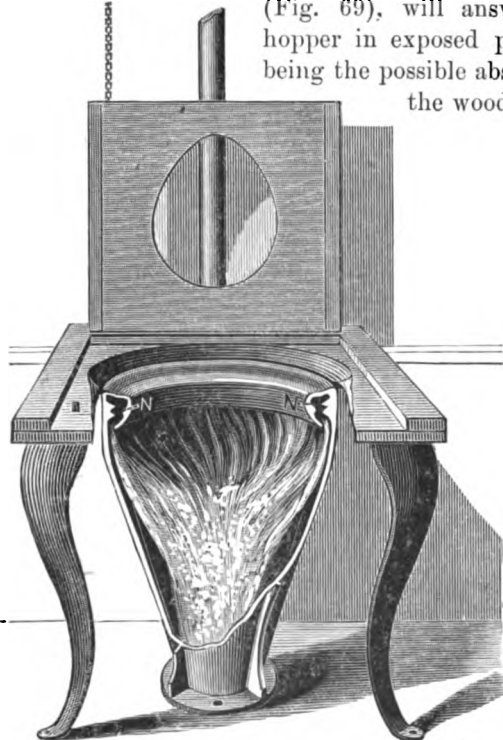


FIG. 68.

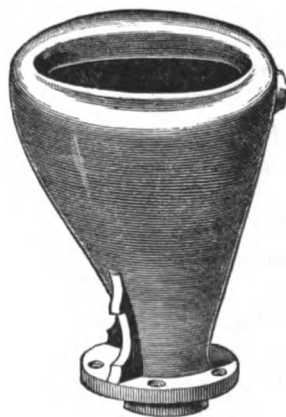


FIG. 67.

Improved flushing cisterns for water closets are manufactured in great varieties; Figs. 64-66 illustrate some of these. Fig. 64 shows a waste





FIG. 69.

preventing cistern, which is worked by a depression of the seat when the closet is used; the flush is therefore automatic. Fig. 65 illustrates a waste preventing cistern which is operated by a pull and tassel. In Fig. 66 the valve of the cistern is opened by lifting a handle at one end of a fixed lever, the other end of which is connected by a chain to a second lever in connection with the valve.

#### 5. WASHOUT CLOSETS.

I have grouped a number of recently invented water-closets into this last class which I consider, *in principle*, far superior to any of the other closets for the following reasons: They are mostly made in one single piece of earthenware and are entirely free from any movable parts. Moreover, the bowl is shaped in such a manner that its outlet or overflow forms a very efficient water seal trap, thus obviating the necessity of a trap under the closet. All washout closets have their basin so shaped as to hold a large quantity of water; the advantages of such an arrangement have been already stated. A washout closet is in fact only a modified form of hopper, the improvement being the shape of the basin permitting the excrements to drop into water, and forming a water seal. Different means are employed with the closets of this class to effect a discharge of the bowl. In many the downward rush of water directed through proper flushing rims so as to concentrate its main force at the outlet of the basin, drives the contents of the bowl into the overflow, and thus into the soil pipe. In others a jet of water is introduced into the outlet pipe and carries all water from the bowl, partly by the force of the jet, and partly by starting a siphoning action. In still others a partial vacuum is created by different means in the outlet and a true siphonage established.

Among the washout closets I mention: the California Syphon Jet closet (Figs. 70*a* and 70*b*), the National Side Outlet closet\* (Fig. 71), Owen's closet (Fig. 72), Bostel's Brighton Excelsior closet (Fig. 73),

\*Lately introduced into this country by Messrs. Henry C. Meyer & Co., New York.

the Lambeth "Flushout" closet (Fig. 74), Carmichael's "Washdown" closet (Fig. 75), Hellyer's Vortex closet (Fig. 76), and others.\*

The "Siphon Jet Water Closet," invented by Wm. Smith, of San Francisco, is shown in Fig. 70, *a* and *b*. It is manufactured either of iron with earthen bowl (*a*), or entirely of earthenware (*b*). A section through the closet, showing the application of the jet, is shown in Fig. 70*a*; a view of the earthenware closet is shown in Fig. 70*b*.

The emptying of the closet is effected by means of a jet introduced at the lowest point of the bowl and delivering into the inclined leg of the closet. This jet carries all water out of the basin, while a small stream from the fan spreader in the bowl is intended to rinse and wet the sides of the closet. After emptying the closet a slow after-flush trickles into the bowl, refilling it to the proper height of the overflow, thus making it ready for another operation.

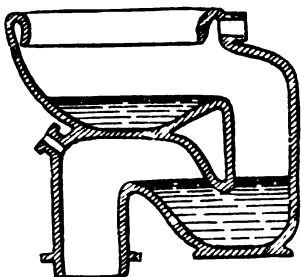
The water for jet and flush is supplied either from a special cistern, to be worked by a pull, or automatically by a depression of the seat, or else through a valve (Fig. 70 *b*), operated by lever and pull. A large supply pipe (1½-inch) from tank to bowl is necessary to make the jet effective. A large head of water—say 9 to 12 feet—is desirable to work the closet satisfactorily. Each flush requires about 3 gallons of water and preferably more. In places where the whole water supply of the house has to be raised by pumping, the large amount of flushing water required may be an obstacle to the use of the closet. In other cases it may prove a difficult matter to locate the water-closet cistern sufficiently high above the bowl. But in places where water is ample (supplied under pressure) and ceilings high, the closet works to great satisfaction. It is strong, durable, most cleanly, without any movable parts, and holds a large body of water in its basin; it has a large water-dip for a trap but no foul matters can possibly lodge in the latter as the force of the jet is introduced at the very point where accumulations of solids are most likely to occur in common traps.

\* Two lately introduced American washout closets are the "Dececo" closet, invented by Col. Waring, sold by A. G. Myers' Sanitary Depot, N. Y., and the "Tidal Wave" closet, sold by Messrs. Henry Huber & Co., N. Y.

Hellyer's Vortex closet is shown in Fig. 76. It is made of finely glazed white ware. "A trap is formed in this closet in conjunction with the basin in such a manner that the mouth or dip of the trap forms the bottom of the basin. By this arrangement a body

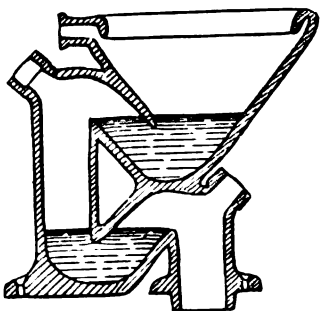
of water is always made to stand in the bottom of the basin or in the inlet of the trap to receive the

FIG. 71



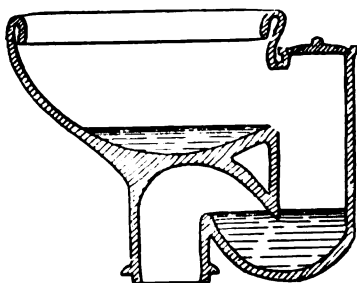
NATIONAL SIDE OUTLET CLOSET.

FIG. 72.



OWEN'S CLOSET.

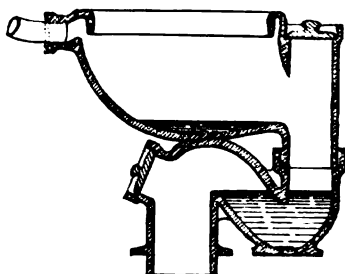
FIG. 73.



ROSTEL'S EXCELSIOR CLOSET

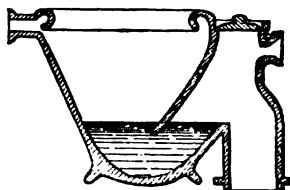
of the basin is such that the excrement shall not touch the sides before passing into the standing water in the closet. By this arrangement of basin and trap the full vertical force of the incoming water

FIG. 74.



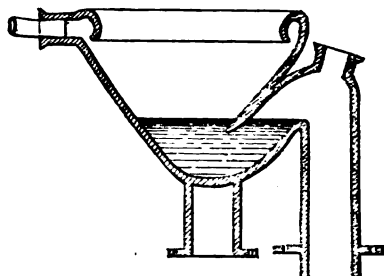
LAMBETH FLUSHOUT CLOSET.

FIG 75



CARMICHAEL'S WASH-DOWN CLOSET

FIG 76.



HELLYER'S VORTEX CLOSET.

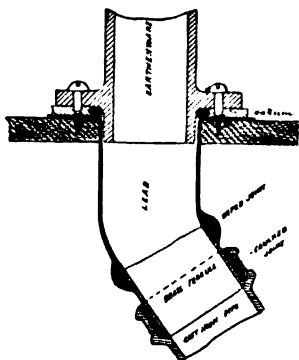
deposit. The water standing in the basin . . . . . is about 5 inches deep. The configuration

supply is brought to bear upon the standing water of the trap, instead of spending its strength upon the basin. . . . Hence, with any fair flush of water, no excrement is left behind, either in the basin or trap, but both are well washed out after every usage of the closet." This Vortex closet may be supplied either from a cistern or from a valve. It is sold by Henry C. Meyer & Co., N. Y.

The Carmichael "Washdown" Closet (Fig. 75) is very similar to the Vortex Closet; both these closets as well as all others, except the "Siphon Jet Closet," are English closets, and seem, of late, to be preferred in England to other styles of water-closets. The three closets, shown in Figs 71, 73 and 74, have the basin and outlet shaped so as to hold water and also have an earthenware trap above the floor; Fig. 72 is a closet with a double trap. Most of these closets have ventilating attachments and inspection holes.

As these closets dispense with the lead S trap underneath, it be-

FIG 77.



comes of the greatest importance to have a tight connection between the closet outlet and the soil pipe. Fig. 77 illustrates the manner of making such a joint. A lead thimble is connected by a wipid joint to a brass ferrule, which is caulked into the hub of the soil pipe. The lead thimble is enlarged at the top and the earthenware flange of the closet inserted into it, resting with its horizontal flange upon a ring, made either of soft india rubber or of oakum, saturated with red lead. The wood screws drawn

through the earthen flange effectively tighten the connection.\*

It is believed that the above classification covers the principal known devices for the reception and removal of faecal matters by the water-carriage system. The merits and defects of the different types of water-closets have, I believe, been sufficiently explained to guide in the selection of a proper closet.

I have omitted latrines or trough water-closets, which are sometimes used in public schools, factories, tenements, etc. A good substitute for these may be found in a number of earthenware hoppers, such as Rhoads', Hellyer's or the Niagara hopper, flushed by an automatic arrangement (McFarland's or Field's tank), entirely independent of the carelessness or forgetfulness of the user of the closet.

\* This same connection should be used for joints between earthen hoppers and lead traps.

## GENERAL ARRANGEMENT OF WATER-CLOSET APARTMENTS.

The almost universal custom of encasing the water-closet in tight woodwork I decidedly condemn. Ventilation is impossible under the seat, and as the floor often becomes wetted with urine or water spilled through careless use of the closet, readily absorbing the filthy liquid, it will constantly remain damp and emit unpleasant odors into the apartment.

As an abundant supply of water is most essential to the interior of the bowl and closet, so is plenty of light and air indispensable to the outside of the closet. A water-closet should stand free on the floor, readily accessible on all sides. The only woodwork necessary is the seat; this should be hinged and leaned against the rear or side wall, when the closet is not in use. Such an arrangement looks especially neat where the floor is laid in tiles, and if the water-closet is entirely of white crockery ware, for instance a Niagara or Hellyer hopper, an earthenware Siphon Jet or other wash-out closet.

Col. Geo. E. Waring, Jr., thus describes such an arrangement:\* a closet, "made of white earthenware, and standing as a white vase in a floor of white tiles, the back and sidewalls being similarly tiled, there being no mechanism of any kind under the seat, is not only most cleanly and attractive in appearance, but entirely open to inspection and ventilation. The seat for this closet is simply a well-finished hardwood board, resting on cleats a little higher than the top of the vase, and hinged so that it may be conveniently turned up, exposing the closet for thorough cleansing, or for use as a urinal or slop hopper. Such closets ought entirely to do away with the use of urinals in private houses, and if, for convenience or to prevent the possibility of baths being improperly used, separate slop sinks are desired, these should be constructed like the hopper closet, the outlet being protected with a movable basket of wire cloth made for the purpose."

The arrangement suggested adds, of course, to the expense of a water-closet, but, where white Minton tiles should prove too costly, a plain cement floor, or slate, or else enamelled tin may be substituted for them.

Wherever woodwork is used for the sake of better appearance of closets having mechanical parts (plunger closets, valve closets), at least the riser should be arranged with lattice work or a great number of perforated holes to provide ventilation under the seat.

It is desirable to locate water-closets near an outer wall, but this is not always possible in American city dwellings. The apartment should have ample light and, wherever possible, a window opening on the exterior of the house for ventilation. Where such a window cannot be arranged special ventilation of the apartment must be provided. Tin

\*See Scribner's Magazine for June, 1881, "The Sanitary Condition of New York City."

or galvanized iron pipes, extended — independently for each apartment — through the roof give good results, especially if a constant draft is created in them by a gas jet. Fresh air should be supplied to the apartment, either by blinds in the door, or else by cutting away the lower two or three inches of the door.

Sometimes a special vent pipe is attached to the closet bowl, leading into a constantly heated flue, used for this purpose *only*; or else an upward draft is created in the vent pipe by connecting it with a chamber, in which a gas jet is burning, and the outlet pipe of which enters the flue, or extends up to the roof. Such a venting of the closet bowl is provided, for instance, in the Zane plunger closet, in R. D. O. Smith's "Odorless Hopper Closet," in the "Worcester Hopper" and others. Fig. 51 shows the pan closet, and Fig. 61 the common hopper arranged with such ventilation directly under the seat, by using an annular flat zinc tube, provided with a number of openings at the inner edge.

It would be a serious mistake to run such vent pipes into a kitchen flue, and far more so to run them into any other chimney of a building. There is at times a downward draft in these—even in the kitchen flue, the fire of which may go out over night—, and thus offensive gases from the closet would be carried into the house. Another reason against such a course is that small vent pipes would soon become obstructed by soot. The best course, where a special flue has not been arranged, is to run the vent pipes along some heated flue up to the roof, and terminate their ends at a point where they are well exposed to the currents of air.

It would almost seem superfluous to state that vent pipes from closet bowls should never enter a soil or waste pipe, or a vent pipe from traps. But such cases are not rare, and an instance of such pernicious practice—which should be considered either as criminal carelessness or else as utter stupidity and inability of the mechanic—was related to me only a short while ago.

No amount of ventilation, however, will keep the air of the apartment pure unless the water-closet is frequently and thoroughly washed and scrubbed. Such cleansing is much facilitated with the above suggested arrangement of a water-closet.

The following valuable remarks of Mr. Edward S. Philbrick upon this subject so fully express my own views, that I quote them *in extenso*.\* "The location of plumbing fixtures in dark corners, under stairways and in closed closets is always to be avoided. Such fixtures, even if of the best materials and design, need frequent washing and even scalding to keep them sweet, and the more light and air can be admitted to them, the more likely will the occupant be to enforce such

\*See articles on "Domestic Sanitation," in the *Sanitary Engineer*, vol. II.

cleanliness. The best authorities in England recommend the location of water-closets outside the house walls, in towers or outside appendages. The rigor of our climate forbids such an arrangement in the Northern States, but they can often be so placed near the outer wall of the house as to allow of a window for the direct admission of light and air, i. e. in the same apartment. This can be done in all suburban houses without an undue sacrifice of light in the living and sleeping rooms, though city houses can rarely afford anything better than skylight and well light for them. . . . The water-closets on the basement floor are generally the source of much trouble by injudicious location and subsequent neglect. The rareness of the inspection generally given to such fixtures by heads of families renders it all the more needful to place them where they can be readily and easily cleaned and well aired. . . . But however good the apparatus and however well located, nothing will compensate for *neglect* by the occupants of the house. Frequent applications of hot water and soap are just as needful to the surfaces of such fixtures as to the bodies of the persons who use them. Of course the woodwork about them should be so put together as to be readily taken apart without tools by any house-maid, to be periodically cleaned and aired. What is the custom in this respect? Expensive apparatus is often seen so boxed up by screwed and even *nailed* joinery, that the spaces so enclosed are practically inaccessible and soon become abominably foul from splatterings. The less amount of woodwork the better, but by all means have the whole so as to be ready of access without the need of so much as a screwdriver, and let every house-maid be taught the necessity of a regular routine in the cleansing operations, scalding and scouring every surface which has been exposed either to the splattering of urine, or even to the perspiration of the body. It may not be always possible to enforce such discipline, but the less it is enforced, the more important become the items of light, air and simplicity of construction, as aids in the same direction. The latter are generally under the control of the architect, and his mistakes of planning entail a *permanent* and incurable evil, which it is therefore all the more important to avoid." . . . "While every aid should be given to cleanliness by simplifying the apparatus, no amount of perfection in this respect will avoid the need of constant thought and care on the part of those who use the fixtures, as well as those whose duty it may be to cleanse them. Such perfections of apparatus are but aids, and though not to be ignored by any means, are after all but of little avail if the people who use them are reckless and wanton in their habits. It is difficult enough to keep such apparatus in good order in private houses where not used by any one beyond the supervision of the head of the family, but the trouble in-

creases in a manifold ratio where fixtures are applied in hotels or public places, or in tenements to be used by more than one family."

#### FLUSHING APPLIANCES.

Flushing tanks should be provided in a system of house drainage, whenever it is impracticable to lay the drain at an inclination which will secure a sufficient cleansing flow. The idea underlying most of these flushing arrangements is the accumulation of a small flow of water—often merely a dribble—which continuously running, at a sluggish rate, would not be able to remove deposits in the drain. Whenever this water has accumulated to a large volume, the flush tank is automatically emptied and its contents are driven with a sudden rush through the drain. As this may be repeated as often as found necessary the inside walls of the drain may be kept thoroughly cleansed and any decomposition of organic matter is thus effectually prevented.

There are many varieties of flush tanks, such as Field's Siphon tank, McFarland's Tilting tank, Shone's flush tank, Maguire's tank, Rhoads', Hydes', Ivers', Wilson's, Guinière's tanks and others.

Field's flush tank is the invention of the well-known English engineer, Rogers Field, and has been used with success in this country. Fig. 78 illustrates his small tank of about 30 or 40 gallons capacity, made in earthenware or cast iron. When the tank is nearly full an additional discharge of about a pail of water starts the siphon, thus the contents of the tank are rapidly discharged. This tank may be fed by the wastes from wash-

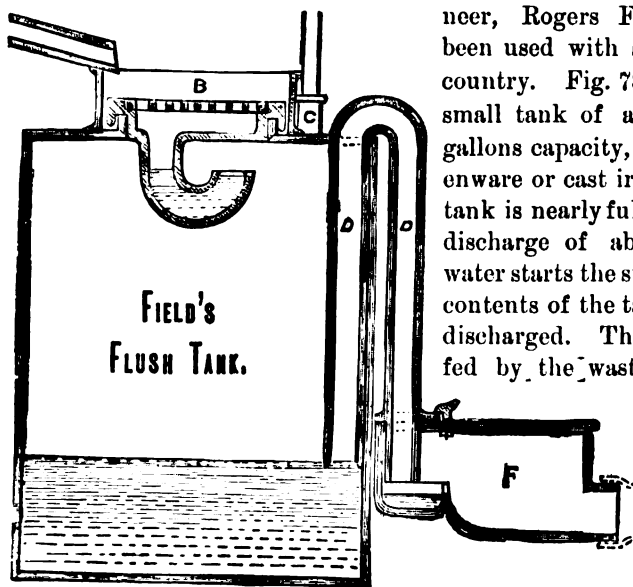


FIG. 78.

bowls, bathtubs, etc. It should not receive wastes from water-closets. Fig. 79 illustrates

the *annular siphon* of Rogers Field, which may be placed either in a tank of brick masonry (Fig. 80), or into an iron cistern (Fig. 81), or tank of wood, lined with lead. A in both illustrations is the annular siphon fitted into the tank B. The longer, inner limb of



siphon reaches into the trapping box or lower water chamber C, in which the water level is kept at about  $\frac{1}{8}$  inch below the end of inner limb of siphon by means of a secondary siphon or weir arrangement (not shown in cuts). When the water from faucet E has filled the tank so that the water rises to the top of the longer (inner) limb of

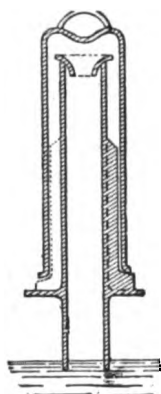


FIG. 79.

the siphon (as shown by a dotted line) it overflows, but is guided by a conical shaped adjutage to drop clear of the sides, and seals the mouth of lower limb. In falling the water carries air with it, which is thus displaced and driven out at mouth of inner limb in trapping box. A slight vacuum is gradually created in the discharging limb, sufficient to start the siphon, which rapidly empties the tank. As soon as air is admitted through outer limb of siphon, its action is stopped, all the water in the inner limb drops into the water chamber, and the auxiliary siphon — or else the weir arrangement — lowers the water line in trapping box about  $\frac{1}{8}$  inch below mouth of inner limb. Air enters at this place and completely breaks the siphon, the tank is then ready for another discharge. The stopcock can be regulated to fill the tank more or less rapidly, according to option. Small tanks are well adapted for flushing a row of hopper-closets or

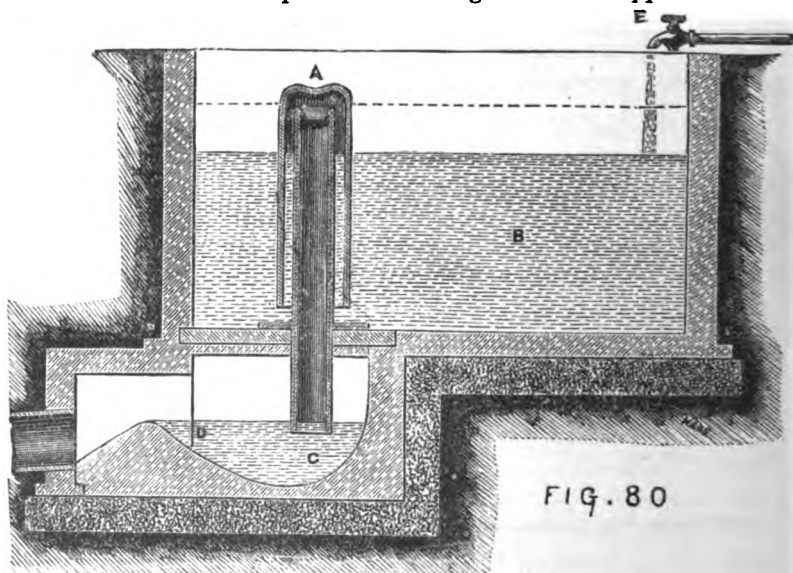


FIG. 80

urinals automatically. Larger tanks are used for flushing house drains,\* but are equally well adapted for sewage disposal works, which, however, do not come within the scope of this essay.

\*And also for flushing town sewers, as at Memphis and other places.

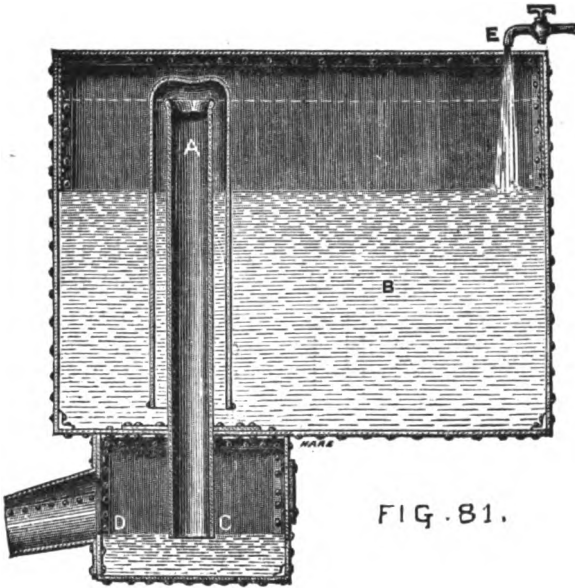


FIG. 81.

McFarland's tank is shown in Figs. 82 and 82a. It works by gravity, and is simply a bucket hung in a cistern, working in brass journals. As soon as filled by a faucet regulated to let the water in

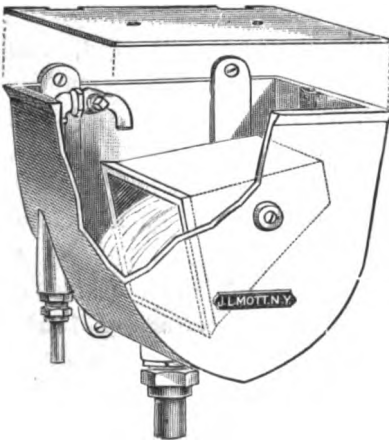


FIG. 82.

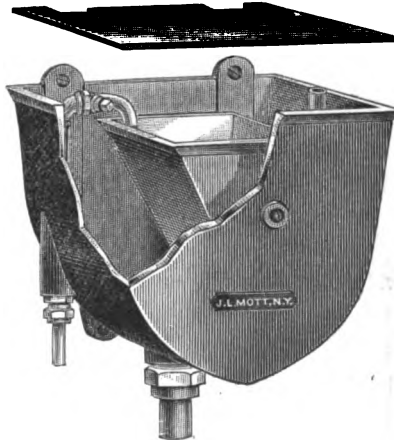
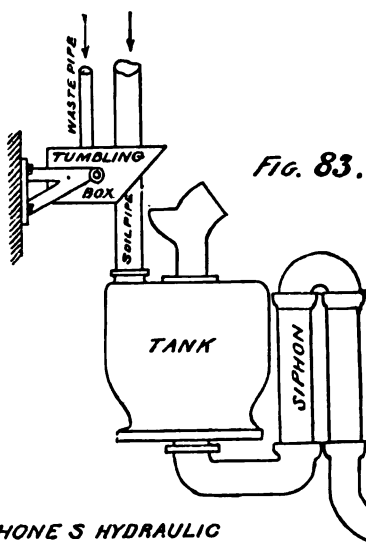


FIG. 82a.

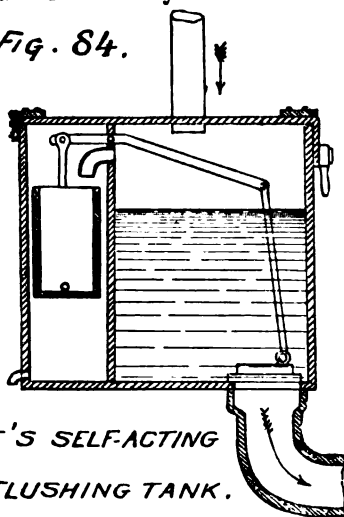
slowly or quickly as desired, the bucket tips over and empties the entire contents at once. This tank is well adapted for flushing closets or urinals. Rogers Fields tank is preferred by many on



SHONE'S HYDRAULIC  
SIPHON EJECTOR.

when the tank is filled by the overflow

FIG. 84.



MAGUIRE'S SELF-ACTING  
FLUSHING TANK.

account of its being free from all movable parts, but it is believed that the tilting tank can be constructed so as to well resist any wear or tear of the axis and journals.

Fig. 83 shows Shone's "Hydraulic Siphon Ejector," the invention of the English engineer Isaac Shone. It may be said to be a combination of a siphon tank and a tilting tank, and its working is readily understood from the illustration.

Fig. 84 shows Maguire's self-acting flushing tank, which is brought into action

when the tank is filled by the overflow delivering into a vessel suspended on one arm of a lever, while to the other the outlet valve is attached.

The weight of water in the vessel lifts the valve, the tank is discharged, and then the vessel empties its water through small outlet holes at its bottom. This tank is brought into action only by a sudden addition of a larger volume of water (same as Field's self-acting tank, Fig. 78).

#### CISTERNS.

These will be considered here only in so far as they have any connection with the drainage system. Both under-ground cisterns and cisterns in the attic of a house should be provided with an overflow. The usual custom has been to connect this overflow-pipe to the drain, or, if inside a house, to the soil-pipe. In consequence of this most

pernicious practice the water was contaminated, and since water is known to be a carrier of disease germs not less so than the air, sickness and deaths were traced to this faulty arrangement.

No overflow from a cistern for cooking, washing or drinking water should be connected to any part of the drainage system under any circumstances. Even if properly trapped the danger is not removed, as the water in this trap evaporates, and as an overflow seldom occurs, no water refills the trap and drain air passes freely into the tank. This overflow should be made to run into the gutter of the roof, wherever this is practicable. In cold climates or in exposed places its outlet should be protected by a flap-valve. If, for some reason, the above course cannot be followed, the overflow should discharge over an open sink in the basement or cellar. If the cistern is located outside of the house the overflow should be carried to some low point, where it should have an open outlet. Blow-offs for water-tanks should be treated similarly to the overflow-pipe.

Cisterns for storage of water, used for drinking and cooking purposes should never be used for flushing water-closets. In all cases the use of a special cistern for each closet or for a group of closets is recommended. The overflow from such cisterns should empty into the closet bowl.

#### REFRIGERATORS.

It is not safe to have a direct connection between a refrigerator waste and drain or soil pipes, for reasons given above for overflows of cisterns. Small refrigerators may waste into a pail to be removed and emptied periodically. Wastes from large refrigerators should empty over an open cup with a waste at its bottom, provided with a reliable mechanical trap and connected to the nearest soil pipe or drain.

#### SAFE WASTES.

In order to prevent the flooding of floors and ceilings, fixtures, such as wash-bowls, bath-tubs, water-closets, etc., are mostly lined with a safe of sheet lead, provided with a waste pipe. In bad plumbing work these "drip pipes" are either joined into the nearest soil or waste pipe—often even without a trap—or else, in the case of water-closet safes, are made to run into the water-closet trap. Such drip pipes should not be connected at all to the drainage system. They should run vertically downward to the cellar, and open either over a sink, or terminate at the cellar ceiling. Should it be feared that the drip pipes might become the channels for leading the cellar air into

the upper rooms, their mouths should be closed with paper, glued over them, or the pipes should have an upward bend, closed by a ball, which is prevented from dropping by wire bands.

#### RAIN LEADERS.

Rain-water pipes may be of galvanized wrought iron, or of tin; when laid inside of a house they should be of cast iron and their joints treated in all respects as those of soil pipes. Before joining the house-drain they should be trapped, if such junction is made beyond the main running trap of the drain, and the trap of the leaders should be sufficiently deep in the ground to prevent its water from freezing. If rain leaders join the drain inside of the house they should not have a special trap. Sometimes a leader delivers into the main trap of the drain (Fig. 4) and thus helps to cleanse the trap.

Rain leaders should never be used as soil pipes nor should they be solely depended upon to ventilate the drain; and, on the other hand, soil pipes should never be used to carry rain water from the roof.

In making a sanitary examination of the Executive Mansion at Washington, under direction of Col. Geo. E. Waring, Jr., the writer had occasion to see an instance of the violation of this rule. The main soil pipe in the building was a 10-inch (!) cast iron pipe, which served the double purpose of receiving the discharge from three water-closets, a urinal, a slop sink and some wash-bowls and bathtubs, and also all the rain-water from the roof. At each rain-fall this large pipe received ample flushing, but in times of prolonged droughts its inner walls became thoroughly slimed and foul with excremental and other matter. In times of violent rainstorms the water rushing down the 10-inch pipe and passing the branch wastes, very likely siphoned all water out of the traps, thus leaving the house unprotected against the foul gases of the soil pipe.

#### DRAINAGE OF CELLARS.

It remains to discuss the proper method of removal of excessive moisture from the soil under and around a dwelling. Unless this is properly attended to cellars of houses will be continually damp, the brick or stone walls will readily absorb the moisture by capillary attraction and an excess of watery vapor will fill the house. The well-known researches of Dr. Bowditch of Massachusetts, and of Dr. Buchanan in England, have clearly established the relation of excessive soil moisture to certain diseases, notably *consumption*, bronchitis, pneumonia and other diseases of the lungs.

Dr. Parkes, in his admirable "Manual of Practical Hygiene" speaks about diseases connected with moisture and ground-water as

follows: "Dampness of soil may presumably affect health in two ways—(1) by the effect of the water, *per se*, causing a cold soil, a misty air, and a tendency in persons living on such a soil to catarrh and rheumatism; and (2) by aiding the evolution of organic emanations. The decomposition which goes on in a soil is owing to four factors, viz: presence of decomposable organic matters (animal or vegetable), heat, air and moisture. These emanations are at present known only by their effects; they may be mere chemical agencies, but more probably they are low forms of life which grow and propagate in these conditions. At any rate, moisture appears to be an essential element in their production. The ground-water is presumed to affect health by rendering the soil above it moist, either by evaporation or capillary attraction, or by alternate wettings and dryings. A moist soil is cold, and is generally believed to predispose to rheumatism, catarrh and neuralgia. It is a matter of general experience that most persons feel healthier on a dry soil."

In order to keep the level of the sub-soil water below a certain depth artificial channels should be provided, laid at that depth and sloping towards some proper outlet which will remove all surplus water. These channels, which carry off only clean water, are also called *drains* (this being the original meaning of the word).

Under the foundation walls of the house trenches dug for this purpose should be filled with loose or broken stones. Drains (common tiles) should be placed two or three feet below and under the cellar floor, with open joints, care being taken to prevent any intrusion of earth at the joints.

The only difficulty, from a sanitary point of view, consists in finding a proper outlet. If the house is a country residence with ample ground around it, and especially if the land is not level, but slopes to some distant valley or creek, it is very easy to continue the main cellar drain with a sufficient pitch to some gutter or open ditch, into which it may discharge.

The case becomes difficult with city houses, on narrow lots, with no other outlet available but the sewer under the street. A direct connection between the cellar drain and the sewer is forbidden for well-known reasons, and even the interposition of a water-seal trap may not be regarded as a sufficient safeguard, for during periods of droughts the water evaporates, allowing the gases from the sewer to pollute the ground under the house.

The drain should run into a mason's trap with *deep* water-seal and filled with coarse sand or fine gravel, and before joining the sewer the drain should be trapped by a running trap, into which, if practicable, a leader should discharge. Another arrangement is to trap the cellar drain, and to provide an outlet for gases which may force the trap, by

a vertical pipe, on the house side of the trap, and opening on the surface of the ground. This is sometimes done, when the sewer is in an alley at the rear of the house, and an open yard gully may be connected to the vertical vent pipe to supply the running trap with water.

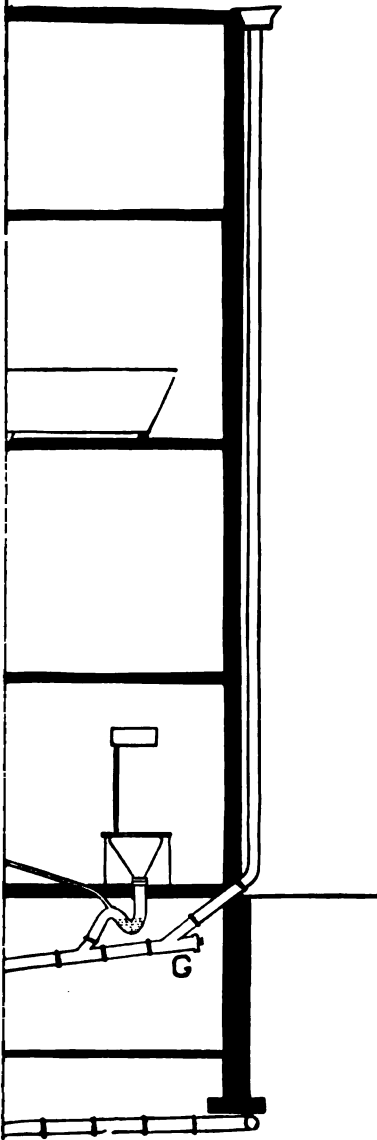
Fig. 85 shows a method of draining cellars of city houses, as recommended by the "Sanitary Engineer," Vol. 4, and explained thus as follows: "Where houses are built in continuous blocks, as in cities, the arrangement shown is appropriate. In this case the pipe under the basement or sub-cellar floor should be of unglazed tiles, laid without mortar of any kind, so that the ground water can get in at any joint, perhaps it is not a tight drain, but a porous one, for clean water only, it need not be made easy of access, but can be closed. Some people connect the ground drain under the water with the outer trap, but it is not so good a plan as the one shown in the cut, for the following reason: In that case the trap water sets back into the ground drain and stands there without circulation, except at such rare intervals as the ground drain is in active use. This occurs so seldom, that the opening where it discharges into the trap is liable to get closed up by fecal matter and other substances which pass by the orifice, and the ground drain has generally insufficient fall to enable its contents to crowd through such a pasty plug and clean itself. The longer this plug remains, the more compact it becomes.

During the winter season, and as long as houses are heated by fires, there is always an inward pressure of air at all cracks and orifices near the basement, and the air which is in these ground drains will at such times press upward through any pores and channels that can be found in the cellar floor, gradually and surely working its way into the house. The ground drain is deeply covered and inaccessible, so that if by any chance it becomes defiled by sewage, it is next to impossible to clean it. It is, therefore, *very* important that these ground drains should be kept quite free from any possible contamination where connecting with the sewage drain.

It is generally advisable to put the ground drains as deep as two or three feet below the cellar floor wherever an outlet can be found at such a level, and this generally precludes the possibility of getting much fall where these ground drains enter the main house drain.

In consequence of this condition of things, a very slight obstruction in the house drain trap, such as may happen from the deposit of a bit of cloth, a broken tea-cup or tumbler in any water closet above, by a servant who thinks water-closets are made to hide such things, would serve to back up all the sewage of the house into the ground drain, if care is not taken to prevent such an event.

If arranged as shown in the plan above, a stoppage in the main trap



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would cause an overflow in the man-hole, which should be inspected frequently and can be cleaned out when occasion requires. But if, as may often happen, it is not possible to get fall enough to prevent such a stoppage backing up the sewage into the ground drain, some special safeguard must be applied in the shape of a mechanical valve. Such valves are not to be generally recommended in pipes where sewage flows, but this ground drain is supposed to carry nothing but clean water. Under such conditions a valve may answer a good purpose. Metal valves, and even brass ones, are subject to corrosion, which would seal them fast to their seats if not often lifted.

A good form for this place is a rubber ball valve arranged as in Bower's trap. But the trap should be specially constructed for this purpose, with a seal of at least twelve inches depth. The clearing screw should of course be on top instead of at the bottom in this case, and should be examined for removal of sand or silt which the water may possibly bring in, especially during the first flow after the drain is constructed. The space around this trap where the water enters it, should be well grouted with hydraulic cement to prevent any back flow outside the pipe, in case of obstruction of sewage, while the valve in the trap will prevent it on the inside. Such a trap in such a position will hold its water for years, but *should be inspected at least twice a year, because it is of great importance to keep it free from sand and supplied with water.*

If the connection with the main drain were to be made beyond the trap in the latter, we should lose the additional safeguard of that trap against the admission of sewer air, which safeguard it is best to retain.

It is equally important to have a dry, impervious floor in the cellar, which can be secured by first laying a base of concrete, upon which a layer of about  $\frac{1}{4}$ -inch of asphaltum should be placed. This makes the floor practically impervious. It should then be properly finished with a layer of best Portland cement.

In order to prevent dampness of walls, that part of the wall below the level of the ground should be executed with particular care. Nothing will better prevent dampness in walls than a "damp course" of some impervious material. Asphaltum is probably best for this purpose, though layers of slate in concrete or damp proof tiles are very efficient. If at all practicable there should be a dry area all around the foundation walls in order to prevent any dampness in the walls originating from the earth surrounding it at the sides. If such an area cannot be provided a *double* wall with an air-space between inner and outer wall should be used.



## APPENDIX.

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### CALCULATION OF VELOCITY AND DISCHARGE OF HOUSE DRAINS AND SEWERS.

The problem of determining the size of a drain or pipe intended to discharge sewage, is strictly a question of hydraulics, and its solution is readily accomplished by means of formulæ and calculations, or by tables, worked out so as to facilitate arithmetic operations.\*

It is, however, often desirable to have the relation between inclination, size, velocity and discharge of a drain or sewer in a shape, which may permit at a glance finding two of the above quantities if the other two are given.

A diagram constructed so as to illustrate the relation of these four quantities, will best serve for this purpose, and the annexed graphical solution of the problem (for whose suggestion the writer is under obligations to M. L. Holman, Esq., Assistant Engineer, St. Louis Waterworks) is offered to meet such a want.

This diagram is based upon Baldwin Latham's Tables, calculated from Weisbach's formula

$$v = \frac{\sqrt{2gh}}{\sqrt{1 + e + c \frac{l}{d}}}, \text{ wherein}$$

- $h$  — head of water in feet.
- $l$  — length of sewer in feet.
- $d$  — diameter of sewer in feet.
- $v$  — velocity in feet per second.
- $c$  — coefficient for friction in pipes.
- $e$  — coefficient of resistance for entrance.
- $g$  — acceleration of gravity = 32.2.

The coefficient  $e$  may be assumed according to Weisbach as = .505 in the average.

The coefficient  $c$  is somewhat variable with the square root of the velocity, viz:

$$c = .01439 + \frac{.016921}{\sqrt{v}}$$

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\* Very complete tables of the velocities and discharges of sewers are given in Baldwin Latham's "Sanitary Engineering."

With a velocity  $v$  and the diameter  $d$  the discharge  $Q$  is accordingly found by the formula:

$$Q = v \times \frac{d^2}{4} \pi$$

$Q$  being discharge in cubic feet per second, the sewer running full.

If we assume the sewer running only *half-full* the discharge *per minute* becomes

$$Q = \frac{1}{2} v \times 60 \times \pi \frac{d^2}{4}$$

Diagram I. gives discharges per minute, the sewer running *half-full*, and this limit of depth of flow is usually assumed for house drains and small sewers. But the velocity is the same for sewers running full or half-full (being proportionate to  $\frac{\text{sectional area of water-way}}{\text{wetted perimeter}}$ , which has the same value for both cases), consequently, the discharge  $Q$  for sewers running full is simply double the value given in the diagram.

For other depths of flow, the velocity should be calculated from Weisbach's formula for flow of water in open culverts:

$$v = \sqrt{\frac{8}{f} \frac{h}{p} \frac{g}{\zeta}}, \text{ in which}$$

$v$  — mean velocity in feet per second.

$T$  — area of the cross-section of water in sq. ft.

$p$  — the wetted perimeter in ft.

$h$  — the fall in ft. in the distance  $l$  (in ft.)

$g$  — acceleration of gravity, 32.2.

$\zeta$  — empirical coefficient of friction, which is somewhat dependent from the velocity, but may, for approximative calculations, be assumed as — .0075.

Tables 1 and 2 were calculated by Robt. Moore, C. E., from this last formula.

It will be seen that, assuming  $\zeta$  as a constant, the velocity  $v$  is proportionate to  $\sqrt{\frac{T}{p}}$ , or to the square root of the hydraulic mean radius. It is evident that the velocity in a circular culvert (drain or sewer) will greatly diminish as the depth of the stream flowing through it decreases. Diagram II. illustrates this change of velocity for different depths of flow. It shows that the velocity is the same for drains running full or half-full; it further shows that the maximum velocity of flow occurs not when the sewer is running full, but when the depth of flow is about .813 of its diameter. The maximum velocity is about 11 per cent. greater than when running full or half-full.\* At a depth of flow of  $\frac{1}{4}$  of the diameter the velocity is only about 77 per cent.

\*The maximum discharge does not coincide with the maximum velocity.  $Q$  is a maximum when the depth of flow is about .95 of the diameter.

of that when running full or half-full, and for lesser depths of flow the velocity diminishes rapidly.

This diagram is well adapted to illustrate the advantage gained by reducing the sizes of drains as much as possible, or in other words, by concentrating the sewage flowing through it.

In order to illustrate the use of Diagram I. examples are given for various cases.

*Problem 1.*—Given the inclination of a sewer to be 1 in 250, and the discharge (if running half-full) 200 cubic feet per minute, what will be the diameter of the sewer and what the velocity of flow in it?

*Answer.*—Turning to the diagram, and following the two curves  $Q$  and  $i$ , to their point of intersection, we find, by going from this point horizontally to the end of the line, the required size to be 17.75 inches diameter, and by going vertically upwards we find the velocity to be about 3.9 feet per second.

If the same discharge should be effected by a sewer running full, we divide first  $Q$  by 2, and look into the diagram for the intersection of  $i=1$  in 250 and  $Q=100$  cubic feet. In this case the required size would be  $d=13.5$  inches, and the velocity  $v$ —about 3.35 feet per second.

*Problem 2.*—How much water does a 6-inch house-drain deliver per minute, running half-full, and laid at an inclination of 1 in 100, and what would be the velocity of the water?

*Answer.*—The intersection of the horizontal line at the diameter 6 inches and the inclination curve 1 in 100 falls between the curves  $Q=20$  and  $Q=30$ , and is found by interpolation to be about 21 cubic feet per minute. By going vertically upward from the point of intersection, we find the velocity to be a little over 3.5 feet per second.

*Problem 3.*—What is the size of pipe necessary to deliver 40 cubic feet per minute (running half-full) with a velocity of 3 feet per second, what inclination should be given to the pipe?

*Answer.*—At the intersection of the curve  $Q=40$  and the vertical line  $v=3$  feet, we find the diameter=9 inches, and the inclination between 1 in 200 and 1 in 250, say 1 in 210.

*Problem 4.*—How much water will a 12-inch pipe, the flow being at the rate of 2.5 feet per second, running half-full, discharge per minute? What inclination should it have?

*Answer.*—The intersection of the vertical lines  $v=2.5$  and horizontal line  $d=12$ -inches gives the discharge to be between  $Q=50$  and 60, say 58 cubic feet per minute, and the grade to be between 1 in 350 and 1 in 400, say 1 in 380.

*Problem 5.*—Given  $Q=400$  cubic feet per minute,  $d=24$  inches, what is  $i$  and  $v$ ?

*Answer.*—The intersection of  $Q=400$  and  $d=24$  falls between the inclination curves  $i=1$  in 250, and 1 in 300, by interpolation  $i=1$  in 280. The velocity is found by going from the point of intersection vertically upward; it is  $v=4.25$  feet per second.

*Problem 6.*—Given  $v=3$  feet per second,  $i=1$  in 90, what is  $d$  and  $Q$ ?

*Answer.*—The intersection of the vertical line  $v=3$  and the curve  $i=1$  in 90, gives  $Q$  between 5 and 10, say about 8 cubic feet per minute, and the diameter to be very nearly 4 inches.

TABLE 1.

## TABLE OF DIAMETERS OF HOUSE DRAINS

With various Grades, and for Lots of different sizes, capable of discharging 2 inches of rain per hour when running three-fourths full.

Calculated by ROBT. MOORE, C. E., St. Louis, Mo.

Dimensions of Lot in Feet.	No. of Acres.		Fall 1 per 100	Fall 1½ per 100	Fall 2 per 100	Fall 2½ per 100	Fall 3 per 100	Fall 4 per 100	Fall 5 per 100
20x150	0.0689	Velocity Diam. Ft. " Inches	2.69 .286 3½	3.16 .263 3½	3.54 .249 3	3.87 .238 2½	4.17 .229 2½	4.68 .216 2½	5.11 .207 2½
25x150	0.0861	Velocity Diam. Ft. " Inches	2.81 .312 3¾	3.30 .288 3¾	3.71 .272 3¼	4.06 .260 3½	4.36 .251 3	4.89 .237 2¾	5.35 .226 2¾
30x150	0.1083	Velocity Diam. Ft. " Inches	2.91 .336 4	3.43 .310 3¾	3.84 .292 3¾	4.20 .280 3¾	4.53 .270 3¾	5.07 .254 3	5.54 .243 3
35x150	0.1286	Velocity Diam. Ft. " Inches	3.00 .357 4¼	3.53 .329 4	3.96 .311 3¾	4.33 .297 3¾	4.66 .287 3¾	5.23 .271 3¼	5.72 .259 3¼
40x150	0.1377	Velocity Diam. Ft. " Inches	3.09 .377 4¾	3.59 .347 4¾	4.07 .328 3¾	4.45 .314 3¾	4.79 .302 3¾	5.37 .286 3¾	5.87 .273 3¼
45x150	0.1550	Velocity Diam. Ft. " Inches	3.16 .395 4¾	3.71 .364 4¾	4.17 .344 4¾	4.56 .329 4	4.90 .317 3¾	5.45 .299 3¾	6.01 .286 3¾
50x150	0.1722	Velocity Diam. Ft. " Inches	3.23 .412 5	3.79 .380 4¾	4.26 .359 4¾	4.65 .344 4¾	5.01 .331 4	5.62 .312 3¾	6.14 .299 3¾
60x150	0.2066	Velocity Diam. Ft. " Inches	3.35 .443 5¾	3.93 .409 4¾	4.41 .386 4¾	4.88 .369 4¾	5.19 .356 4¾	5.88 .336 4	6.37 .321 3¾
70x150	0.2410	Velocity Diam. Ft. " Inches	3.45 .471 5¾	4.06 .435 5¼	4.55 .410 4¾	4.98 .392 4¾	5.35 .378 4¾	6.01 .357 4¾	6.57 .343 4¾
80x150	0.2755	Velocity Diam. Ft. " Inches	3.54 .497 6	4.17 .458 5¾	4.68 .433 5¼	5.11 .414 5	5.50 .399 4¾	6.17 .378 4¾	6.75 .360 4¾
90x150	0.3099	Velocity Diam. Ft. " Inches	3.63 .521 6¾	4.27 .480 5¾	4.79 .454 5¾	5.23 .434 5¼	5.63 .418 5	6.32 .395 4¾	6.91 .378 4¾
100x150	0.3443	Velocity Diam. Ft. " Inches	3.71 .544 6¾	4.36 .501 6	4.89 .478 5¾	5.35 .453 5¾	5.75 .436 5¼	6.45 .412 5	7.05 .394 4¾
125x150	0.4304	Velocity Diam. Ft. " Inches	3.87 .594 7½	4.56 .548 6¾	5.11 .517 6¼	5.59 .495 6	6.01 .477 5¾	6.75 .450 5¾	7.38 .431 5½
150x150	0.5165	Velocity Diam. Ft. " Inches	4.02 .639 7¾	4.73 .589 7½	5.30 .556 6¾	5.80 .532 6¾	6.24 .513 6½	7.00 .484 5¾	7.65 .463 5¾
175x150	0.6026	Velocity Diam. Ft. " Inches	4.14 .680 8½	4.87 .627 7¾	5.47 .592 7½	5.99 .569 6¾	6.45 .546 6¾	7.22 .515 6¼	7.89 .498 6
200x150	0.6887	Velocity Diam. Ft. " Inches	4.26 .717 8¾	5.06 .661 8	5.62 .624 7¾	6.14 .597 7¾	6.61 .576 6¾	7.41 .544 6¾	8.10 .520 6¾

$$\text{FORMULAE}—v = \left( \frac{19420}{769} \text{hd.} \right)^{1/2} \quad d = \left( \frac{4n^2}{10h} \right)^{1/5}$$

d = Diameter in feet; v = Velocity; n = No. of Acres; h = Fall per 100 feet.



TABLE 2.—DIAMETERS OF SEWERS

Capable of Discharging 50 gallons per front foot, or 1250 gallons per house (35 front feet), per day when running three-fourths full.  
Calculated by ROSE, MOORE, C. E., St. Louis, Mo.

FALL OF SEWER PER 100 FEET.																			No. of Houses.
No. Front Foot.	.3	.4	.6	.8	1.0	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00		
100	.134	.108	.100	.094	.090	.086	.088	.081	.078	.077	.075	.074	.073	.071	.070	.069	.068	4	
200	.164	.143	.132	.124	.119	.114	.110	.108	.108	.101	.099	.097	.096	.094	.093	.091	.090	8	
300	.188	.168	.155	.146	.140	.134	.129	.125	.122	.119	.116	.114	.113	.110	.109	.107	.106	12	
400	.216	.188	.174	.164	.157	.150	.145	.140	.137	.133	.131	.128	.126	.123	.122	.120	.119	16	
500	.237	.206	.190	.179	.172	.164	.158	.153	.149	.145	.143	.140	.138	.135	.133	.132	.130	20	
600	.255	.222	.204	.193	.184	.176	.170	.165	.161	.157	.154	.151	.148	.146	.144	.143	.140	24	
700	.271	.236	.217	.205	.196	.188	.181	.175	.171	.167	.163	.160	.156	.153	.151	.149	.148	28	
800	.286	.247	.227	.215	.207	.197	.191	.185	.180	.176	.172	.169	.165	.162	.160	.157	.156	32	
900	.299	.261	.240	.227	.217	.207	.200	.194	.189	.184	.181	.177	.174	.171	.169	.167	.164	36	
1,000	.313	.272	.250	.237	.226	.216	.209	.202	.197	.192	.188	.185	.182	.179	.177	.174	.171	40	
2,000	.413	.359	.331	.319	.309	.298	.286	.275	.267	.254	.249	.244	.240	.236	.233	.229	.226	80	
3,000	.465	.432	.399	.387	.381	.368	.354	.343	.335	.326	.319	.313	.308	.303	.297	.293	.289	120	
4,000	.504	.472	.437	.425	.412	.397	.383	.369	.357	.346	.338	.332	.326	.321	.315	.311	.307	160	
5,000	.544	.512	.477	.465	.450	.435	.421	.407	.395	.384	.375	.368	.362	.356	.351	.346	.342	200	
6,000	.583	.550	.515	.503	.488	.472	.457	.444	.431	.419	.409	.401	.394	.388	.383	.378	.374	240	
7,000	.624	.591	.556	.544	.528	.512	.497	.484	.471	.459	.448	.439	.432	.426	.421	.416	.412	280	
8,000	.660	.627	.592	.579	.563	.546	.531	.517	.504	.492	.481	.472	.464	.457	.451	.446	.442	320	
9,000	.703	.668	.633	.620	.604	.587	.571	.557	.544	.532	.521	.512	.504	.497	.491	.485	.481	360	
10,000	.753	.718	.683	.670	.654	.637	.621	.607	.594	.582	.571	.562	.554	.547	.541	.535	.531	400	
20,000	1.085	.901	.831	.818	.802	.785	.769	.755	.741	.728	.717	.708	.700	.693	.687	.681	.676	800	
30,000	1.217	1.060	.977	.962	.946	.929	.913	.898	.884	.870	.858	.846	.837	.829	.823	.817	.812	1,200	
40,000	1.365	1.189	1.086	1.068	1.052	1.035	1.018	.999	.983	.968	.954	.941	.930	.921	.914	.908	.903	1,600	
50,000	1.513	1.312	1.196	1.176	1.160	1.143	1.126	1.107	1.090	.974	.960	.946	.934	.925	.918	.912	.907	2,000	
60,000	1.668	1.438	1.306	1.284	1.267	1.250	1.232	1.213	1.195	1.176	1.160	1.145	1.132	1.122	1.114	1.107	.994	2,400	
70,000	1.768	1.487	1.351	1.328	1.310	1.292	1.274	1.255	1.236	1.217	1.201	1.185	1.171	1.160	1.152	1.145	.994	2,800	
80,000	1.893	1.569	1.446	1.398	1.379	1.360	1.341	1.322	1.303	1.284	1.267	1.250	1.235	1.223	1.215	1.208	.994	3,200	
90,000	1.969	1.644	1.516	1.431	1.406	1.386	1.367	1.348	1.329	1.310	1.292	1.275	1.260	1.248	1.239	1.232	.994	3,600	
100,000	1.970	1.715	1.581	1.498	1.473	1.453	1.434	1.415	1.396	1.377	1.359	1.341	1.324	1.312	1.303	1.296	.994	4,000	

$$\text{FORMULA, } d = \left( \frac{n^2}{h} \cdot \log^{-1} 0.7739303-10 \right)^{1/5} - \gamma \left( \frac{n^2}{h} \right)^{1/5}$$

d—Diameter in feet. n—Number of front feet. h—Fall per 100 feet.

# DIAGRAM I.

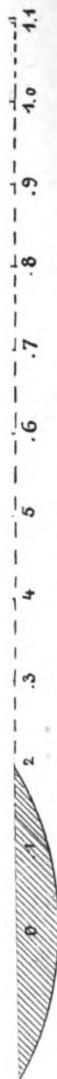
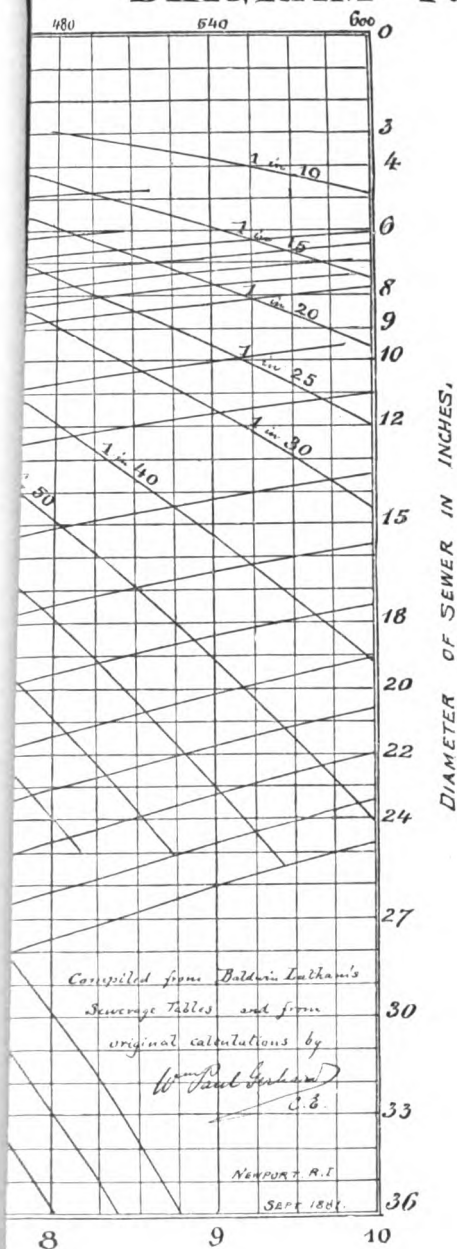


DIAGRAM REPRESENTING CHANGES OF VELOCITY IN A CIRCULAR SEWER OF THE  
DIAMETER = 1, LAID AT A GIVEN GRADE, AT DIFFERENT DEPTHS OF FLOW

W. P. GRAHAM, C.E. 1881.

TABLE 2.—DIAMETERS OF SEWERS

Capable of Discharging 50 gallons per front foot, or 1250 gallons per house (25 front feet), per day when running three-fourths full.  
Calculated by ROBT. MOORE, C. E., St. Louis, Mo.

# DIAGRAM II.

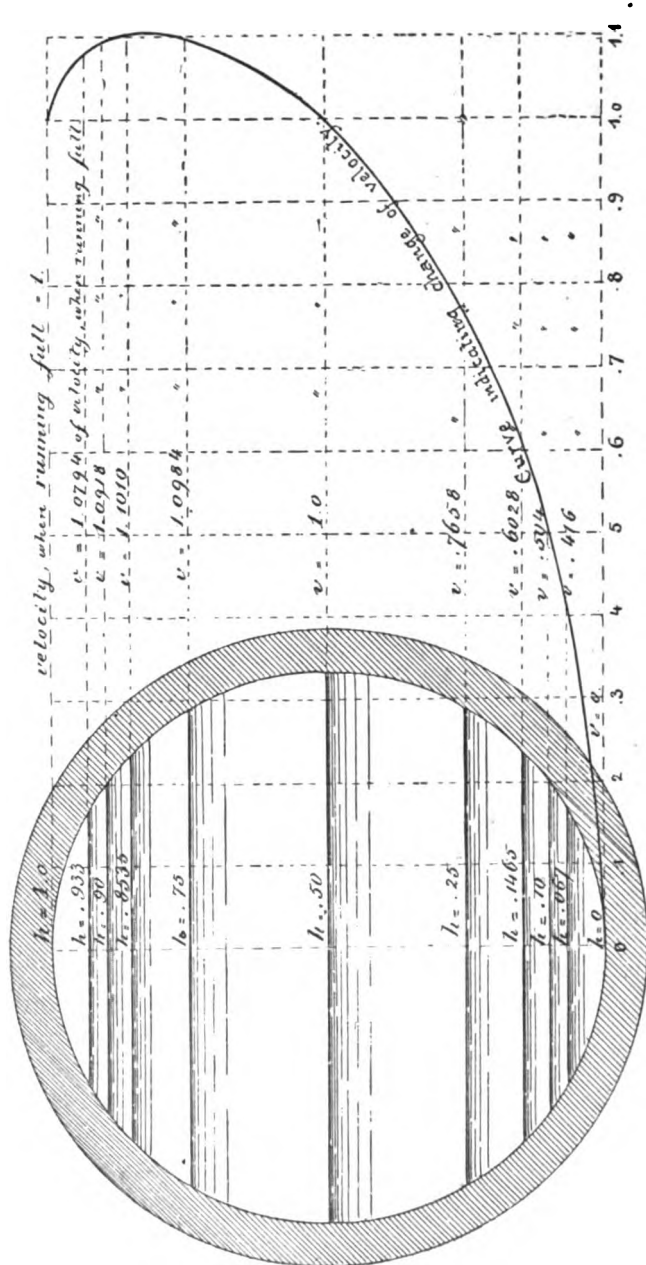


DIAGRAM REPRESENTING CHANGES OF VELOCITY IN A CIRCULAR SEWER OF THE DIAMETER .1, LAID AT A GIVEN GRADE, AT DIFFERENT DEPTHS OF FLOW

W. P. BARNARD, C.E., 1901



# APPENDIX.

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## THE LAWS OF RHODE ISLAND

IN RELATION TO

### Vital Statistics, the State Board of Health, and Marriage.

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#### PUBLIC STATUTES CHAPTER 85.

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##### OF THE REGISTRATION OF BIRTHS, DEATHS AND MARRIAGES.

SECTION 1. The town clerks of the several towns, or any person whom the board of aldermen of any city, or the town council of any town may appoint for that purpose, shall obtain chronologically record and index, as required by the forms prescribed by section three of this chapter, all information concerning births, marriages and deaths occurring among the inhabitants of their respective towns; and on or before the first Monday in March, annually, shall make duly certified returns thereof to the secretary of the state board of health for the year, ending on the thirty-first day of December next preceding, accompanying the same with a list of the persons required by law to make returns to them, who have neglected to do so, and with such remarks relating to the object of this chapter as they may deem important to communicate.

SEC. 2. The Secretary of the state board of health shall receive the returns made in pursuance of the preceding section, and annually, make a general abstract and report thereof, in form as prescribed by section three of this chapter, and publish not exceeding one thousand copies thereof. Said returns, after such report is prepared, shall be deposited in the office of the secretary of state, who shall cause the same to be arranged, full alphabetical indices of all the names to be made, and the whole to be bound in volumes of convenient size, and carefully preserved in his office.

SEC. 3. The blank forms required to carry out the provisions of this chapter, shall, on application, be furnished by the secretary of the state board of health to clergymen, physicians, undertakers, town clerks, clerks of meetings of the Society of Friends and other persons requiring them, substantially as follows: The record of a birth shall state the date and place of birth, name and sex of the child, whether born alive or still-born, the name and surname, color, occupation, residence and birthplace of the parents, and the time of recording, so far as the same can be ascertained. The record of a marriage shall state the date of the marriage, place, name, residence and official station of the person by who

married, names and surnames of the parties, age, color, occupation and residence of each, condition, that is whether single or widowed, what marriage, that is whether first, second, third or other marriage, the occupation, birthplace and name of their parents, and the time of recording, so far as the same can be ascertained. The record of deaths shall state the date of death, name and surname of deceased, the sex, color and condition, whether single or married, age, occupation, place of death, place of birth, names and birthplace of parents, disease, or cause of death, and the time of recording, so far as can be ascertained.

SEC. 4. Every meeting of the Society of Friends, clergyman, and all others authorized to join persons in marriage, shall make a faithful record of every such rite performed by them, in manner and form aforesaid, and return the same for the last preceding month, on or before the second Monday of every month, to the town clerk of the town in which such rite shall have been performed; and no marriage shall be solemnized until the parties shall have signed and delivered to the person about to solemnize it, or to the clerk of a meeting of the Society of Friends, a certificate containing the information required for the record of a marriage, as prescribed by this chapter.

SEC. 5. The town clerk of every town shall annually, in the month of January, collect the information required by this chapter, in relation to all children born in the town during the year ending on the thirty-first day of December next preceding.

SEC. 6. Whenever any person shall die, or any still-born child shall be brought forth in this State, the physician attending at such bringing forth or last sickness, if any physician so attended, shall within forty-eight hours after such death or bringing forth, leave with the family, if any, or person having the care of the deceased, or the person bringing forth such still-born child, or give to the undertaker or person who conducts the funeral, a certificate stating in case of a death the name of the deceased, the date of the death, and the disease or cause of the death, and in case of the bringing forth of a still-born child, the date and the cause of such child being brought forth still-born.

SEC. 7. Every town council may appoint a sufficient number of persons to act as undertakers, removable at the pleasure of such council.

SEC. 8. No undertaker or other person shall conduct a funeral, or bury or deposit in a tomb, or remove from this State or otherwise dispose of the remains of any deceased person or still-born child, unless he shall first obtain the physician's certificate required by section six of this chapter, if a physician was in attendance upon such person who has deceased, or the person bringing forth such still-born child, and shall return the same, together with his own certificate of the information required by section three of this chapter, to the town clerk of the town where such death or bringing forth took place.

SEC. 9. Any town may make ordinances, more effectually to attain the objects herein contemplated.

SEC. 10. The town clerks, or persons appointed as aforesaid, shall receive for each record of a death made and returned as required by law, and for each record of a marriage made and returned as required by law, twenty cents, to be paid to them out of their respective town treasuries: *Provided*, that the yearly compensation to be paid out of the town treasury as aforesaid, to any one town clerk or person appointed as aforesaid, who shall perform the duties prescribed by this chapter, shall not be less than five dollars. Undertakers and others making returns of deaths as required by section eight of this chapter, shall receive for each full report of a death made to the town clerk, five cents, in the

cities of Providence and Newport, and ten cents in the other towns of the State.

SEC. 11. Every clergyman, physician, undertaker, town clerk, clerk of any meeting of the Society of Friends, or other person, who shall wilfully neglect or refuse to perform any of the duties imposed on, or required of him, by this chapter, shall be fined not exceeding twenty dollars for each offence, one half thereof to the use of the town in which the offence shall occur, and one half thereof to the use of the person who shall complain of the same.

SEC. 12. Every clergyman, physician, coroner, undertaker or clerk of any meeting of the Society of Friends, shall cause his name and residence to be recorded in the town clerk's office of the town where he resides.

SEC. 13. No letters of administration or letters testamentary shall be granted by any court of probate, upon the estate of any person, until the death of such person, or the facts from which the same is presumed, shall be duly certified, as near as may be, to the town clerk, in order that the same may be duly registered according to the provisions of this chapter.

SEC. 14. The town clerks of the several towns, the city clerk of the city of Newport, and the city registrar of the city of Providence, shall have the custody of all records of births, deaths and marriages of their respective towns, whether made under the statutes now in force or any former statute, and a certificate signed by them, certifying that any written or printed statement of any marriage, birth or death is a true copy of the record in their custody, shall be admitted as evidence of such marriage, birth or death.

SEC. 15. Births, marriages and deaths of non-residents shall be distinguished from those of residents in the returns, by being arranged separately.

SEC. 16. The secretary of the state board of health may, from time to time, vary the forms of returns, and require such additional information as he may consider necessary to accomplish the object of this chapter.

SEC. 17. The town clerks or other officers appointed under this chapter to collect, record and return the births in the several towns, shall receive fees therefor as follows: For making record and return of these facts as required by law, twenty cents each for the first fifty entries in each calendar year, and ten cents each for each subsequent entry and return; to be paid by the town in which the birth is recorded.

SEC. 18. The town clerks of the several towns, or other persons appointed under this chapter to collect the births in the several towns, shall annually in the month of January, collect the facts concerning the births within their respective towns, required by this chapter; and shall so far as practicable, at the same time collect the names of all persons liable to be enrolled in the militia, as required by title thirty-four; and the census of all persons between the ages of five and fifteen years inclusive, as provided by chapter fifty; and shall receive therefor such compensation as the town council or the board of aldermen of their respective towns or cities shall determine: *Provided*, that the city of Providence shall be exempt from so much of the provisions of this section as relates to the collection of the statistics of births.

SEC. 19. Blanks for the foregoing purposes shall be furnished, on application therefor, on or before the first day of December in the year preceding, by the state board of health, for the collection of births, by the adjutant-general, for the taking of the enrolled militia, and by the commissioner of public schools, for the census aforesaid.

SEC. 20. The person or persons who shall discharge the duties required by section eighteen of this chapter, if other than the town clerk, shall make full



return thereof to the town clerk of his or their town, on or before the tenth day of February next following.

SEC. 21. The returns required to be made by clerks of the supreme court, in relation to divorces, to the secretary of the state board of health, or a prepared abstract thereof, shall be published in the annual report on the births, marriages and deaths in the State.

## CHAPTER 198.

### OF DIVORCES.

SECTION 5. The clerks of the supreme court in the several counties, shall make returns to the secretary of the state board of health, on or before the first day of March, in each and every year, for the year ending on the thirty-first day of December preceding, of all the applications for divorce, showing the number, the number granted, and the causes which are given for the application, but without the names of the parties, in accordance with the blanks which shall be furnished them by the secretary of the state board of health.

## CHAPTER 83.

### OF THE STATE BOARD OF HEALTH.

SECTION 1. The governor, with the advice and consent of the senate, shall appoint six persons, two from the county of Providence, and one from each of the other counties, who shall constitute the state board of health, one of whom shall be appointed in each year for the term of six years from the first day of July. Any appointment to fill a vacancy shall be for the remainder of the term. Of the persons so appointed, at least three shall be well educated physicians and members of some medical society incorporated by the state. The governor may remove any member for cause, at any time, upon the written request of two-thirds of the board.

SEC. 2. The board shall take cognizance of the interests of life and health among the citizens of the state. They shall make investigations into the causes of disease, and especially of epidemics and endemics among the people, the sources of mortality, and the effects of localities, employments, conditions and circumstances on the public health, and shall faithfully do all in their power to ascertain the causes and the best means for the prevention of diseases of every kind in the state. They shall publish and circulate, from time to time, such information as they may deem to be important and useful for diffusion among the people of the state, and shall investigate and give advice in relation to such subjects relating to the public health, as may be referred to them by the general assembly, or by the governor when the general assembly is not in session.

SEC. 3. The state board of health shall also investigate the subject of diseases among cattle or other animals.

SEC. 4. The board shall meet in the city of Providence once in three months, and as much oftener as they may deem necessary. No member of the board, except the secretary, shall receive any compensation for his services; but the

actual personal expenses of any member, while engaged in the duties of the board, shall be paid by the state.

SEC. 5. The board shall elect a well qualified physician as their secretary, who shall be *ex-officio* a member of the board, the commissioner of public health, and state registrar, but he shall not be permitted to vote on any question in which he is personally interested, or be entitled to any additional compensation for mileage or expenses.

SEC. 6. The secretary of the said board shall make inquiry from time to time, of the clerks of town and local boards of health, and practicing physicians, in relation to the prevalence of any disease, or knowledge of any known or generally believed source of disease, or causes of general ill-health, and also in relation to the proceedings of the said boards of health, in respect to acts for the promotion and protection of the public health, and also in relation to diseases among domestic animals in their several towns and localities respectively; and the said clerks of town and local boards of health, and the said practising physicians, shall give such information, in reply to said inquiries, of such facts and circumstances as shall have come to their knowledge.

SEC. 7. The secretary shall perform and superintend the work prescribed for said board by law, and such other duties as the board may require, and he shall receive such salary not in excess of twelve hundred dollars annually, as the board may determine. He shall hold his office during the pleasure of the board, and may be removed at any regular meeting, by a majority vote of the members thereof.

SEC. 8. The governor shall provide a suitable office for the board in the city of Providence, and the actual expenses of the board and of the members thereof, when certified by the chairman and approved by the governor, shall be paid from the state treasury.

SEC. 9. The board shall make a report in print to the general assembly, annually, of its proceedings during the year ending on the thirty-first day of December next preceding, with such suggestions in relation to the sanitary laws and interests of the state as they shall deem important.

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## SYNOPSIS OF THE LAW OF MARRIAGE IN RHODE ISLAND.

### TITLE XX, CHAPTER 163 PUBLIC STATUTES.

SECTIONS 1, 2 and 3 show what kindred persons cannot marry, and declare marriages within prohibited degrees, null and void.

SECTION 4 makes an exception in favor of Jews, within the degrees of affinity or consanguinity allowed by their religion.

SECTION 5 declares the marriage of persons having a husband or wife living, and of idiots or of lunatics, absolutely void.

SEC. 6. "Any ordained minister or elder of any religious denomination, who shall be *domiciled* in this state, and either justice of the supreme court, may join persons in marriage in any town of the state." (It will be seen that clergymen from other states *cannot solemnize marriages* in Rhode Island. Marriages solemnized in Rhode Island, by clergymen living out of the state, are null and void.)

SECTION 7 defines what shall be understood by the term "religious denomination," within the meaning of the preceding section.

SEC. 8. Wardens in the town of New Shoreham, may join persons in marriage in said town.

SECTION 9 provides that no minister, elder, magistrate or warden shall join persons in marriage, unless such persons, if residents of this state, shall first present a certificate properly executed and signed by the town or city clerk or city registrar of the town or city in which such persons shall reside, and if not residents of this state, then from the town or city clerk or registrar of the town or city in which the marriage shall be solemnized, to the effect that the said town or city clerk or registrar has *duly recorded* the *intention* of marriage between the parties named in the certificate, and no town or city clerk or city registrar shall issue such certificate to any minor or person under guardianship, unless the consent in writing of the parent or guardian shall have been first obtained.

SECTION 10 provides that every society of Friends, and every person authorized to join persons in marriage shall certify upon the certificate required in section nine of this chapter, the time when and the place where the marriage shall have been solemnized by him, and shall on or before the second Monday of every month return the certificate of every marriage solemnized by him during the last preceding month, to the clerk or registrar of the town or city in which such rite shall have been performed.

SECTION 11 forbids the solemnization of the marriage ceremony, by any person, when lawful objection is made thereto in writing, until such lawful objection be removed.

SECTIONS 12, 13 and 14 provide that any person who shall join persons in marriage contrary to, or in violation of, chapter 163 of the Public Statutes, shall be imprisoned not exceeding six months, or fined not exceeding one thousand dollars.

SEC. 15. The solemnization of marriage shall be in the presence of two witnesses at least, besides the minister, elder or magistrate officiating.

SECTION 16 relates to marriages among Quakers or Friends, and among Jews, making them valid if in accordance with the forms, rites and ceremonies of the same respectively.

SECTION 17 provides that any persons joined in marriage in this state, who have neglected to comply with the law as set forth in the preceding sections, shall be imprisoned not exceeding six months, or fined not exceeding one thousand dollars.

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